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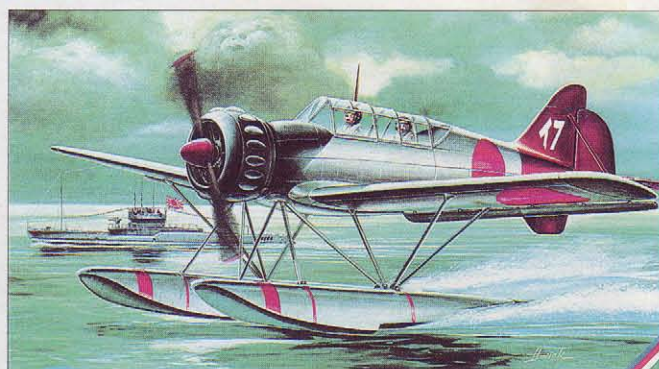
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EDITORIAL

It hardly seems ten minutes since I sat down to write the editorial for the first issue of *Scale Aviation Modeller*. For this issue, we've had so much editorial for the magazine that some of our regular features, such as the Book Review column, have had to be held over until the March issue.

In the past four weeks I have received many letters concerning the content of *Scale Aviation Modeller* – and as a result of the constructive criticism contained within them, I have begun to make changes to the magazine to bring it into line with what you, the reader, wants. The modelling content has been increased and will increase still further in coming months. In the meantime, if you have any comments to make about *Scale Aviation*

Modeller and its contents, please write to the editorial address. We do read and take notice of everyone's viewpoint but we can only do this if you tell us what you like and dislike.

At this stage I should like to thank all those kit, decal and accessory manufacturers and suppliers who have so kindly sent us material for review. I am having difficulty in fitting everything into the 48 pages available, and some reviews have been held over until our next issue. This lack of space will hopefully come to an end as the publishers intend to increase the page content of *Scale Aviation Modeller* to 68 pages within the next two months, giving more room for more kit reviews. In the meantime, I should like to place on record my special thanks to

Hannants, Mary-L, Four Plus, Exact Decals & Details and Avia Imports for supplying items for review.

I'm also delighted to welcome Gary Madgwick of the Aviation Workshop to our editorial team. Gary has kindly reviewed the Ertl KC-135 as part of our special feature on the Stratotanker and is even now beaver away on a Tornado F.3 for the March issue.

Finally, my sincere apologies to Jonathan Mock for omitting to include a photograph of his completed Martlet V conversion. It was missed in error in the scramble to get the magazine to the printers and on the shelves before Christmas.

Sue Bushell
Editor

CONTENTS

New on the shelf	52
Reviews of the most recent releases: kits, decals and accessories	
North American's T-28C Trojan	56
Malcolm Lowe passes on the secrets of his prize-winning Heller 1:72nd Trojan	
Unternehmen Bodenplatte – Operation Baseplate	63
Barry Ketley reviews the Luftwaffe's Big Punch, with colour artwork from Peter Green	
Austrian Whorled Printed Fabric	66
Ian Huntley reviews information on this 1918-vintage camouflage	
SAAB JAS39 Gripen	69
Lindsay Peacock looks at the newest fighter from the Swedish stable	
KC-135 STRATOTANKER SPECIAL	
Colour schemes and markings	75
Six pages of colour schemes, drawn by Mark Rolfe	
KC-135 Stratotanker	82
Lindsay Peacock chronicles the history of Boeing's versatile tanker	
Modelling the KC-135	88
Gary Madgwick build the 1:72nd Ertl KC-135A	
Letters	90
New Markings on the Chinook fleet	91
R L Ward visits Odiham to bring news of HC.2 markings	
Free Advertisements	94

New on the shelf . . .



Barry Money builds the new Aeroteam Yak-11 (LET C-11)

The Yak-11 was a direct descendant of the Yak-3 fighter, although with its seven-cylinder radial engine and tandem two-seat cockpit this might not be instantly apparent. Awarded the NATO code-name *Moose*, it was also built in Czechoslovakia as the Let C-11.

From the Czech firm of Aeroteam comes this first (as far as I am aware) injection-moulded representation of this aircraft. The kit is moulded in a rather soft grey plastic, and is about on a par with the better short-run kits from today's 'cottage industry' manufacturers. That is to say, it's quite good, but leaves plenty of room for the modeller to exercise his skills to improve it.

Internal detail consists of side walls, instrument panels, control columns and two very good bucket seats. This all assembles to a floor panel, prior to installation into one fuselage half. When the canopy, which is acceptably clear, is in place, the cockpit looks quite full.

Construction follows conventional methods, and there is some flash to be cleaned up, particularly around smaller parts like undercarriage legs. A moderate amount of filler is required, but no more than on the average kit in this category.

SCALE: 1:72nd
PRICE: £7.99
TYPE: Injection-moulded

The decal sheet offers three aircraft – two Czech examples and one from Egypt which was the option I chose. Decals are in register and apply very well. They are perhaps on the thin side as the base colour tends to show through the white areas.

Instructions take the form of exploded diagrams and are quite easy to follow. All parts are numbered. Four-view drawings for each of the three decal options are included and FS595 numbers are given for the paint schemes involved.

Also in the box is a ten-page booklet containing fourteen black and white photographs showing various parts of the aircraft in close-up. This is an excellent idea. The booklet also includes a short text in both Czech and English, giving a potted history of the aircraft's production and some very useful cutaway drawings showing internal structure of the full-size aircraft.

In my opinion, review models should be made straight from the box using kit-supplied decals, and this is what the photograph shows. I used stretched sprue for aerials, some filler, and opened up the scribed intake in the port wing root, otherwise 'what you see is what you get'.

All in all I liked this kit, and on a scale where 1 is unbuildable and 5 is excellent, I give it 3. Trailing edges need thinning and there's some heavy detail on the fabric-covered areas, but the potential for a very good model is there.

Meanwhile, Richard Franks gives his views on MPM's A7M Reppu

The Mitsubishi A6M series is well known to all but its replacement, the M-50 Reppu (Hurricane) is not. Envisaged to enter service in 1945, the A7M featured self-sealing fuel tanks, bullet proof windshield and hydraulically operated folding outer wing panels. Its maiden flight was made on 6 May 1944 and although its manoeuvrability was good, it was underpowered. A new powerplant meant a complete redesign of the forward fuselage and the A7M2 did not fly until 13 October 1944. It showed great promise and was ordered into production but earthquakes, allied bombing and the crash of the prototype slowed the project somewhat. Only three prototypes and a single production airframe were completed by the end of the war.

This new kit from the Czech company MPM is a welcome addition to a growing range of Japanese types produced by the major manufacturers. It is still a limited production run and is further enhanced with the addition of etched brass detail parts and an acetate backing for the instrument panel. The kit comprises 37 plastic and 23 etched brass pieces, plus the instrument panel and a vac-formed canopy.

Construction is standard for limited run kits and most of your time will be occupied with preparing the plastic parts and sanding joints to ensure a good fit. For a change MPM has decided to offer you the choice of either using or discarding the etched brass pieces. This means that you can make the cockpit area up purely with plastic or go the whole hog and use the brass as well. I like this approach as many modellers who are put off by the inclusion of brass can still make this model.

And so to construction. You may need to cut down the engine insert (Part 6) as it does

not fit into the fuselage halves. The cockpit area is inserted from underneath the fuselage once it is joined together and this makes life a lot easier. As I have said, quite a lot of time is needed to clean up all the plastic parts before you start assembly, but there is one piece which is a problem. The propeller (Part 7) has a huge sprue attachment point which covers almost the entire hub area. To remove it from the sprue is difficult, so cut it off well back from the part. To get rid of all the excess plastic is not an easy task and a variety of blades in the modelling knife is needed here – this one piece will take as long to clean up as all the other parts put together! The outer wing panels need to have 8 degrees of dihedral, so don't forget that.

The kit does include plastic undercarriage doors, although no mention is made of them in the instructions. Most people will prefer to use the etched versions anyway as the plastic parts are a little thick. The undercarriage struts (Parts 23L and 23R) are secured in the bay via simple butt joint, not a wholly agreeable method but one which does seem to work. The retraction struts for the oleo legs are supplied in both plastic and brass (Parts 24 and F11 respectively) – the plastic parts are hard to clean up as they are very fragile, but I think they look more convincing than the flat etched alternatives.

One of the low points of this kit are the main wheels. First, once completed and fitted they look far too small and secondly, the moulding is poor, resulting in lop-sided halves and flash build-up by the hubs which is impossible to remove. The kit does come with etched hub centres for these wheels but that excess plastic does get in the way and results in the etched pieces sitting proud of the wheel. I don't know if the wheels are the same size as fit-

SCALE: 1:72nd
PRICE: £9.99
TYPE: Limited run
 injection-moulded

ted to the A6M series, but if so I would advise people to replace the kit parts with the resin A6M wheels offered by Squadron Products.

The cockpit rear area decking (Part 13) can be added from beneath the fuselage at the same time as the cockpit, or it can be left until later. I opted for the late attempt, mainly to see if it was possible. It is a little tricky to get it into position to secure it, but if you stick it on a bit of Blu-Tack and then cement it to the model with Plastic Weld you should have little trouble. The final task was to cut out the vac-formed canopy and secure it before masking it for spraying.

As so few examples of the A7M existed there's little in the way of colour options. The kit does give two schemes: the third experimental airframe which carries a tail number and another unidentified prototype with the excellent orange undersurfaces common to Japanese experimental aircraft of this era. I opted for the unidentified prototype simply because I like the orange undersurface of that type! The upper surface is IJN Green (Xtracolour X353). The undersides are a different matter as I think that to date no one has made the orange colour used in Japan and as a result you



will have to make it up yourself. The box illustration will help you determine the shade and I used a mix of one part RLM 23 (X217) and two parts RLM 04 (X213), as this seemed to fit the bill nicely. As with other Japanese types of this period a translucent blue lacquer was used in the undercarriage area and this colour is available in the Xtracolour range (X355). Finally, the propeller is identified as Red Brown N12, a colour which again is not yet available. However, if like me you have a tin of the old Humbrol Authentic RLM 61, you will find it a suitable alternative. If not I would have thought that Humbrol 98 Matt Chocolate would do.

With all the colours sprayed on and left to dry fully, it was time to apply the decals. The example I chose could not be easier as it is simply a case of three different sizes of Hinomaru and that's it! The decals used by MPM are very good but rather thin. They have a tendency to curl up if removed from the backing sheet so do not attempt this; approach the decalling 'properly' and slide each decal off the backing sheet onto the model. I tried both MicroSet and AeroSet solutions and they worked well, as did MicroSol and AeroSol. My preference is for the AeroMaster setting solution and the MicroSol decal solvent, but make your own minds up as none have

any adverse effect on the decals. My final task was to add and paint the aerial mast (Part 10) and the cockpit step (F9) before the whole model is oversprayed with matt varnish.

Overall a sound model of the Zero's replacement. The topic is unusual and one that I think has only ever been done by Aoshima in injection-moulding, so this is a nice addition to any collection. The option of both etched brass or plastic parts is a sound move on MPM's part and one which means that this is a kit I can recommend to any modeller with a modicum of experience under their belt. My thanks to Hannants for the review sample.

Recent decal releases . . .

SUPERSCALE

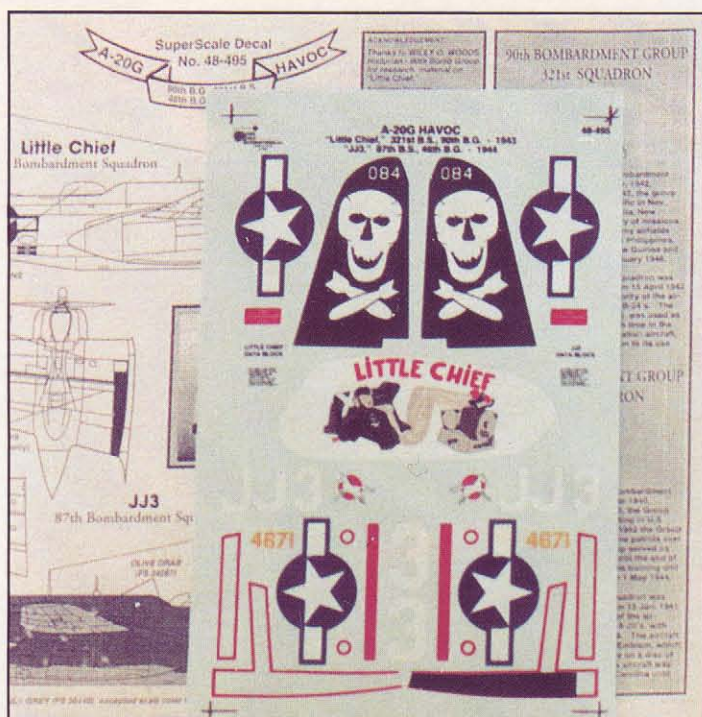
SuperScale sheet 72-691 is for four B-25D aircraft from the 345th Bomb Group operating in the Pacific during World War 2. Printing is to a very high standard and in register. Individual aircraft featured are 130013 *Jelly Belly* of the 499th Sqn, 130058 *Lucky Bat* of the same unit, 130074 *Tin Liz* of the 501st and 130517 *Crab 2nd*, also of the 499th. All of these aircraft are olive drab and grey and a model should show the ravages of operations under the Pacific sun. Checked against the references quoted

on the instruction sheet, these decals are complete, accurate and recommended.

SuperScale sheet 72-692 is for a further four B-25Ds from the same Group, this time 130028 *Blunder Bus* from the 499th, 130437 *Little Thumper* from the 501st, 130014 *Jayhawk*, again from the 499th, and 130089 *The Gay Mare* of the 501st. The sheet is very well printed and accurate when checked against its quoted references. Adorned with the markings supplied on these sheets and with coloured cowl-ing rings these will result in



SuperScale's recent decal releases include the P-40E (sheets 72-693 and 48-492, 48-493 – latter shown above left) and B-25D (sheet 72-691 is illustrated above right).



SuperScale sheet 48-495 for the A-20G Havoc.

eye-catching models. My only reservation is that I believe *Jayhawk* should carry its name on the port nose in white lettering and this is not on the sheet. I may be wrong, but it was certainly there later in the aircraft's career, when it also carried the Group's distinctive bat design on the nose area.

SuperScale sheet 72-693 continues the Pacific theme with five P-40E Warhawks from the 49th Fighter Group, all with artwork and the sheet contains all markings and national insignia for all five aircraft.

SuperScale Sheet 72-694 covers the Lockheed P-38 Lightning, with two from the 94th Fighter Squadron/1st Fighter Group, and one from the 48th Fighter Squadron/14th Fighter Group, all operating in the Mediterranean area in World War 2. The aircraft depicted are an 'E', 'F' and 'H', all in olive drab and grey. They are 17587 *Happy Jack's Go Buggy-Texas Terror* and 17991 *Bat Out of Hell* from the 1st, and 17854 *Tangerine* from the 14th Fighter Group. All markings for the three subject aircraft and national insignia are provided, along with a fair amount of stencilling.

Turning to 1:48th scale, Sheet 48-492 is for three P-40E Warhawks – two from the US and one Russian example. The American aircraft are *Tarheel* flown by Lt G. Predey, *Angel*

flown by Lt J A Angel, both from the 49th Fighter Group, while the Russian aircraft is that flown by Major P.A. Pokryshev. All markings required to model all three aircraft are supplied and the sheet is very well produced.

SuperScale sheet 48-493 is for three more P-40s, this time from the 343rd Fighter Group operating in the Aleutians in 1943. The aircraft from the 49th are those of Captain Hennon and Major Sims (also covered on 72-693), and the remaining aircraft on this sheet was flown by Major John Chennault and carried a large tiger's head on the cowlings.

SuperScale sheet 48-494 is identical to sheet 72-694 and again carries all the markings for the three P-38s, while 48-495 covers a pair of A-20G Havocs, one each from the 90th and 46th Bomb Groups. The 90th was the famous *Jolly Rogers* Liberator group and this A-20 was used as a hack by the 321st BS. It carries the group's skull and crossbones on its rudder and the most gorgeous young lady on the nose. The 46th Group (a training unit) aircraft carries its squadron emblem, a white horse on a red disc, as well as white cowl fronts on a basic olive drab and grey finish. This sheet has national insignia for only one aircraft but all the other markings needed are there.

SuperScale sheets cost £3.95 per sheet and have improved greatly in the recent past – all these sheets are highly recommended. The instruction sheets are little historical gems on their own and well worth collecting. Our thanks to Hannants for the review copies.

Barry Money

THE RETURN OF RUB-DOWN TRANSFERS

I am sure that there are many modellers out there who will remember the old series of rub-down transfers offered by Letraset some time ago. The idea behind these was that they were easier and quicker to apply. The concept did not take off, however, and today most transfers are of the water slide variety.

Only a few months ago I saw an advertisement in an American modelling magazine for a new range of rub-down transfers, mainly of seat belts. It was a pleasant surprise to find examples of these new items turning up at the editorial offices. Manufactured by Exact Decals & Details in Pittsburgh, the six sheets we received were:

- Rivets, Silver
- Lines, Silver
- Jets 1:72 Seat Belts
- WW2, all 1:72 Seat Belts
- German WW2 1:72 Seat Belts
- WW1, all 1:72 Seat Belts

The seat belts are a khaki colour with silver buckles and a brown fob. The method of applying these new transfers is the same as previous types: the image you require is cut from the rest of the sheet, ensuring that you do not press down on

the image or remove the protective backing paper. Once the image is free, remove that backing paper and locate the image wherever you want it. With the tip of a blunt instrument, or – as I use – a long matchstick with the end rounded off, press the image down onto the model's surface through the top sheet. The image will fog, which indicates it has freed itself from its mounting paper. Once all the image is free, gently peel away the top paper and the transfer will be in position. It is important to remember that the images are susceptible to damage at any stage, so try not to handle them until you have secured them with a coat of varnish (or similar).

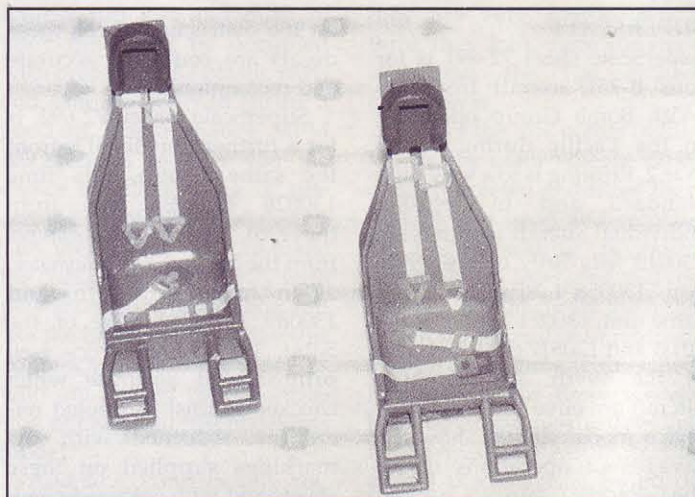
The quality of these new transfers is very high, as can be seen in the accompanying publicity photographs. At present each sheet costs \$8.00 plus 50c post and packing. The minimum order is two sheets and Access and Visa credit cards are accepted. The range can be obtained from Exact Decals & Details at 340 Mansfield Avenue, Pittsburgh, PA 15220, USA.

My thanks to Charlie Donath of Exact Decals & Details for the review samples.

R. Andreux

AEROMASTER

From AeroMaster Decals come two sheets for the Heinkel 111. Sheet 48-120 is entitled 'Blitz Bombers Part 1' and has markings for two Luftwaffe aircraft operating against the British Isles in 1940. Both carry the standard RLM 70/71 over



Exact Decals & Details have made a range of rub-down transfer seat belts.

It is always a pleasure to see some more etched brass sets from Eduard and I was therefore very pleased when I was passed these three sets by the UK importers Four Plus UK during the Chiltern Model Show.

I am always amazed by the speed at which Eduard can create these sets and the standards they achieve time and time again. It has only been a few months since their release, but already they have done sets for the Hasegawa 1:72nd A6M2-N Rufe and Bf 109G-6. Having a liking for the big radial-powered American types I was also very pleased to receive the new set for the Testors F8F Bearcat in 1:48th scale.

The first set is 72-138 and is for the excellent new Messerschmitt Bf 109G-6 from Hasegawa. The set contains a new instrument panel with acetate backing. There is a complete cockpit area with floor and side walls – this is one area that is completely missing in the kit! A new seat is also included, plus rudder pedals, head rest armour and cockpit canopy hand-holds. The flame shields for the exhaust stacks are also included along with wing radiator screen inserts and the retaining strop for the 300 litre drop tank. New undercarriage doors and wheel well inserts are also included. This is a superb kit which will enhance an already good kit. It certainly covers the 'missing' areas of the kit, namely the cockpit interior and for that alone is well worth its asking price. One item included in this set which I would like to see Eduard dispense with is an etched brass radio mast – sorry, it just does not work in this medium.

The next set, 72-143, is for the Nakajima A6M2-N 'Rufe' and is once again designed for the new Hasegawa kit. This fret is very impressive, absolutely crammed with parts and much larger than usual. The fret contains the new instrument panel and acetate backing, plus the cocking arms for the machine guns above the panel. A whole etched cockpit insert with floor and side wall detail is included, plus a perforated seat, seat belt harness and rudder bar and pedals. This cockpit area really

has to be seen to be believed – the detail and number of parts involved is truly staggering! The remaining detail parts include the ring and bead sight, canopy lock, separate flaps (complete with interior detail) and rocker cover detail and ignition harness for the engine. This really is a superb set and one which is reflected by the need of *three* pages of instructions. The cockpit area is excellent and those separate flaps just add the icing to the cake.

The final set was a bit of a departure for me – it was American and in 1:48th scale. This fret, 48-108, is for the Grumman F8F Bearcat and is designed for the Testors kit. The set includes a new instrument panel and acetate backing, plus full side console detail. A new set of rudder pedals is also included, along with a new seat and seat belt harness. The coaming above the instrument panel is also included; therefore giving a much better scale effect on its visible edge. The tubular roll-over frame behind the pilot's head is also replaced. The

strakes by the tail wheel bay are included, along with some details for the tail wheel oleo itself. Final details include a new set of undercarriage doors and oleo torque links plus a full set of inserts for the main wheel wells. This is another excellent set and one which will add a lot to the Testors kit.

Overall, these sets are up to the standard we have come to expect from Eduard, whilst the A6M2-N fret offers just a little bit more than usual. I may find that etched brass drives me to distraction at times, but if done properly the effect is breathtaking. I can only hope that a set for the Hasegawa Bf 109G-14 will follow, along with sets for the forthcoming Hobbycraft late 109s, Avia and Hispano (subtle hint!).

My thanks to Four Plus UK for the chance to review them. These and all other Eduard products can be obtained from Four Plus UK – see their advert elsewhere in this magazine for a complete listing. Very highly recommended.

Richard A. Franks



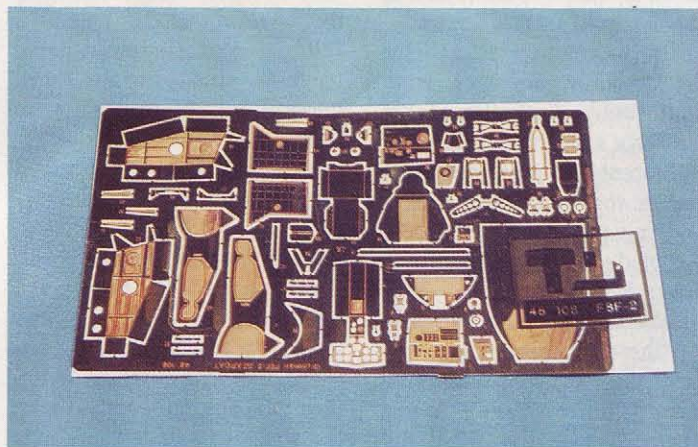
AeroMaster's sheet 48-120 covers a pair of Heinkel He 111s.

65 colour scheme. The aircraft depicted are an He 111H-14 of 1/KGr. 100 operating from Vannes, France, and a He 111H-6 of Stab/KGr. 53 from Lille. All insignia, codes and emblems needed are on the sheet, and a small additional sheet carries the white stripes required by the KGr. 53 aircraft. Paint references are given for AeroMaster's own new range of paints. I have yet to try these, but if the paint is as good as the decal sheet, I shall be very impressed.

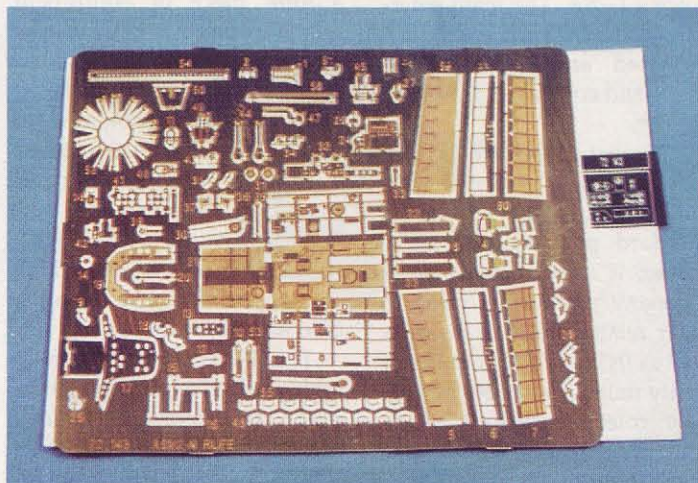
AeroMaster's other sheet, 48-121, is entitled 'Heinkel 111 Collection Part One' and covers two 111H-6s, one from 2/KGr. 27 in Russia in 1943, and the other with StG 3 at Derna, Libya in 1941. The Russian front aircraft is in the winter scheme of white topsides over blue with some areas also painted black underneath for night operations.

The second aircraft on this sheet, in complete contrast, is in RLM 79 Sand topsides over RLM 78 Blue undersides, with white theatre markings on fuselage and wingtips. References and paint advice is again included. These are high class decals, well up to AeroMaster's usual standards. Each sheet costs £4.50 and are available from Hannants, whom we thank for the review examples.

Barry Money



Above: F8F Bearcat etched brass from Eduard. Below: The same manufacturer's magnificent A6M2-N.



NORTH AMERICAN'S COLOURFUL TROJAN

modelled and photographed by Malcolm V. Lowe

An aircraft type that was to become well-known for its vital role in the US Navy's pilot training programme for virtually three decades, the North American T-28 Trojan first flew in its original form as far back as September 1949 and served with the US Navy in two main and distinct versions from the mid-1950s until into the 1980s.

Conceived from an original specification in the United States for a trainer to replace the world-famous NA T-6 Texan, the T-28 was not only to become a highly successful trainer in its own right, but also gained considerable distinction as an armed light attack aircraft in service with a variety of air arms and in a number of conflicts around the world. The T-28A initial production model served primarily with the US Air Force and the success of this version aroused the interest of the US Navy. Following a successful evaluation, the type was duly adopted by this service.

The production aircraft for the US Navy, however, were significantly dissimilar to the Air Force's machines in having a different and more powerful engine, together with a three-blade propeller rather than the two-bladed unit fitted to the T-28A. A speed brake was installed under the fuselage and these differences, coupled with the Navy's distinctive high-visibility trainer paint scheme made the T-28B the Navy's first production version appear quite unlike the Air Force's T-28A. The main external difference is the redesigned and altered nose shape and cowlings of the Navy aircraft.

The first T-28B Trojan first flew in April 1953 and this model became the US Navy's standard primary and basic trainer. It fulfilled these roles for many years in addition to other related training tasks as well as flying with a number of utility units in a variety of support roles, including drone controller, station flight and check flight duties.



The success of the 'B' model in service allowed the US Navy to examine the possibility of consolidating basic pilot training together with initial aircraft carrier qualification in a single aircraft type, and the result was the adoption of the T-28 as a fully aircraft carrier capable machine. This led to the T-28C version which first flew in September 1955. A total of 299 of this model was built and it differed from the its predecessor in a number of respects, most notably in having a tailhook installed. The hook fitted neatly into a cut-out in the lower rear fuselage and rudder, while the rear fuselage structure was strengthened to take the stress of arrested landings and the tail bumper repositioned. The tailhook itself was a long piece of equipment which projected beyond the end of the rudder and resulted in the overall length of the 'C' being increased compared to the 'B'. The T-28C also featured a slightly reduced diameter three-bladed propeller and some were fitted with a slightly smaller nosewheel which also appears to have been the case with some T-28Bs.

The T-28C proved to be a highly effective carrier qualification trainer for the US Navy in the hands of such units as VT-5, their highly colourful

tailhook-equipped Trojans becoming a familiar sight in the skies off the coast of Florida and over the Gulf of Mexico as they busily performed their deck landing and take-off practice aboard the aircraft carrier *USS Lexington*. A number of T-28A and T-28B aircraft were later brought up to the 'C' model standard, and it was not until the late 1970s that the Trojan started to be phased out of US Navy service with the eventual emergence of the Beechcraft T-34 and the currently used T-34C Turbo-Mentor. The final Navy Trojans were retired in 1984.

Although the Navy's Trojans could theoretically carry underwing armament this was not usually a widely-used capability. However, virtually every other operator of the T-28 and its various derivatives principally employed the aircraft at one time or another as an armed aircraft, either for training or for more war-like roles. One of the chief armed versions of the Trojan was the T-28D, a model created through the rebuild of surplus T-28A (plus some 'B' and 'C') airframes primarily for light ground attack and COIN (counter-insurgency) missions. However, all basic versions of the Trojan were exported overseas, and eventually a large

number of 'Third-World' countries used the type in one or more versions, often as armed aircraft.

The Trojan was also employed by the French in the conflict in Algeria during the early 1960s. In French service the armed aircraft was known as the Fennec. This was a remanufactured T-28A, and after re-engining the aircraft resembled early US Navy aircraft except that it was fitted with underwing pylons as standard and also featured a prominent air intake just ahead of the windscreen, in addition to a rollover frame between the front and rear cockpits. Some of these aircraft were later re-exported to third world countries when the war in Algeria ended.

In later years a number of specialist re-modelled T-28 conversions such as the Hamilton Nomair were created, and a turboprop-engined version was developed by North American although it did not enter production. Nevertheless, the Nationalist Chinese in Taiwan still operate an indigenous turboprop-powered derivative of their own design and production. In the United States a great many airworthy ex-military T-28s still exist, mainly on the display circuit in civilian hands.

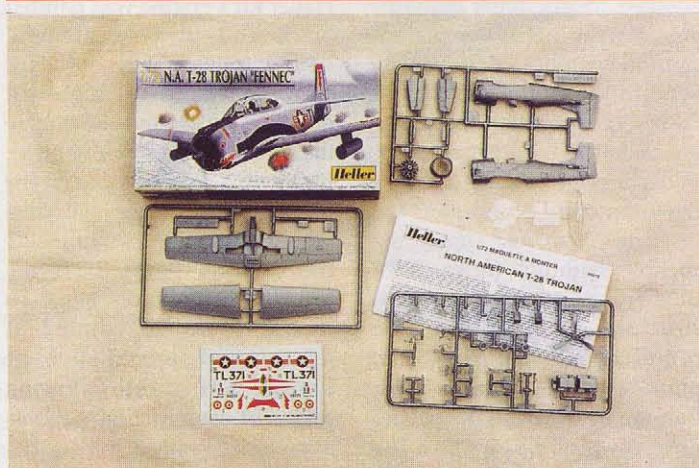
Modelling the T-28 Trojan in 1:72nd scale

An aircraft with a long and varied history, the T-28 has nonetheless only been produced as an injection-moulded kit in 1:72nd scale by one manufacturer – Heller. Although the resulting model is a reasonably good approximation of the original, the kit represents a French-operated Fennec. Originally released a number of years ago, like several other of Heller's smaller aircraft models the kit was recently re-released and is currently listed in the manufacturer's 1994 catalogue. It includes two markings options, one for a French-operated Fennec and the other for an aircraft in South Vietnamese Air Force markings. The kit mouldings are actually all Fennec, and feature the large air intake just ahead of the windscreen plus the rollover frame between the two cockpits that were hallmarks of this version, in addition to underwing pylons including the huge mounting near the main undercarriage bays – although no gun pods are included in the kit to put onto this big inner pylon!

The kit can be made 'straight from the box' as a French operated Fennec, but if you want to make virtually any version of the aircraft other than the French version it is necessary to remove the large air intake immediately ahead of the windscreen, and most trainer Trojans did not carry the rollover frame. If you want to make the South Vietnamese option on the kit's decal sheet, you

should remove the air intake and rollover frame and add armoured backs/headrests for the crew seats. However, I wanted to make a classic US Navy-operated model from the kit, and it is a comparatively straightforward conversion to build the model as a T-28C with a tailhook. A colourful set of specialist markings was produced some years ago by MicroScale (now SuperScale) for US Navy Trojans and this was used for my model, although there are several faults with this sheet as noted later. I also decided to drop the flaps on my model, as most Trojans when left to stand on the ground can be noted with flaps in the down position. Similarly, I also modelled the speed brake 'down'. An excellent cockpit detail set is available for the Heller kit in the Airwaves range of etched brass specialist products, and reference is made to this later. Those modelling the T-28 of any version are recommended to arm themselves with the very useful Squadron/Signal 'In Action' title on the type: the cover picture on this issue, incidentally, is of the exact aircraft that my completed model resembles.

The following stages illustrate the building and conversion sequence for the Heller kit, plus notes on using the cockpit detail set and finishing the model as a US Navy-operated aircraft.



The basic Heller kit.

THE BASIC KIT

Moulded in silver-grey plastic, the kit is generally well produced with engraved lines for the control surfaces, but much of the rest of the exterior of the fuselage, tailplane and wings is covered with many raised panel lines which in some places are cross-hatched. My first job was to remove all the raised lines with wet and dry paper, leaving just the lines of rivets and even these were reduced in size before I rescribed some of the panel lines to give a more authentic surface finish. The T-28's large cockpit transparency is moulded in one piece and is very clear. The kit's decal sheet is reasonably well-produced, but I would not like to try and apply the sharkmouth decal for the South Vietnamese-vintage option over the large lower

cowling air intake on the model!

The Airwaves cockpit detail set, which one can buy separately to use with this kit, is up to the usual high standards and thoroughness of this producer, with instrument panels, side consoles, rudder pedals, seat panels and straps, plus various small parts together with a complete etching for the under-fuselage speed brake – which allows one to model this feature in the open position following a little conversion work.

DETAILING THE COCKPIT

I began construction with the cockpit interior, and here I found the Airwaves detail set very useful in helping to add much neat detail to what is a large cockpit interior. As I intended to model the cockpit covers in the open position I

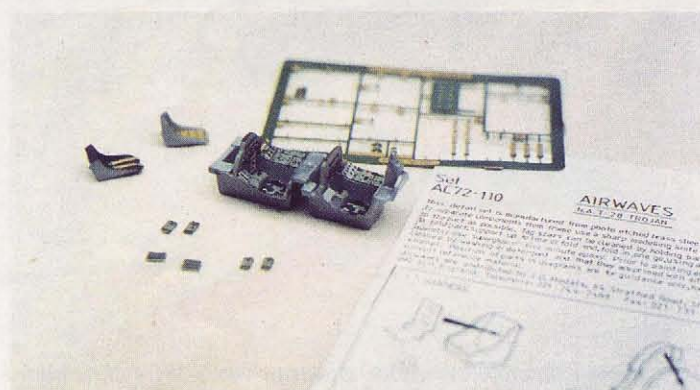
needed to add as much detail as possible. The set is AC72-110 in Airwaves' increasingly comprehensive range.

I first separated the various relevant Airwaves parts from their etched brass fret with a sharp knife, and cleaned the parts with detergent prior to painting them. For the side consoles and instrument panels I filed away the moulded 'detail' bumps in the relevant positions on the Heller cockpit 'bathtub' (Part 17) and instrument panel pieces so that the etched brass Airwaves parts would fit snugly in place. In addition to the 'bathtub' and instrument panel pieces I also utilised the Heller control columns, but these are too high as moulded and should be shortened by approximately 1.5 mm at their bases.

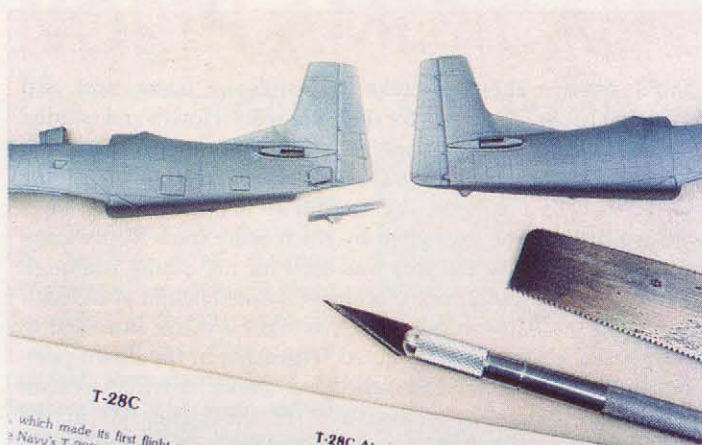
The Airwaves instructions give all the basic relevant construction information, and I used Loctite gel-type non-run-

ning superglue to fix the various parts in place. The cockpit interior was painted mid-grey, with the side consoles, floor and rudder pedals in varying grey tones to accentuate and highlight these specific areas. The various switches on the etched brass consoles were highlighted by dry brushing dark grey onto them. The instrument panels were painted dark grey, with the instrument faces in black with white detail and the instrument dial surrounds dry brushed in a lighter grey to highlight them. Not included on the Airwaves instrument panels but relevant for T-28C model is a small lever on the lower right of the panels just beside the end of the third from top row of instruments, which was the tailhook up/down lever: I used one of the tiny etched brass levers in the Airwaves set for this.

The seats were painted dark grey and dry brushed with a



Detailing the cockpit area



Removing the rear under-fuselage in preparation for tailhook installation.

slightly lighter grey to highlight their edges and the ribbing on the etched brass seat panels. The etched seat straps were painted a greenish tan shade, with the buckles in dull silver before the seats were fixed in their intended places in the cockpit 'bathtub'. If mastered well, the use of varying shades based around the basic interior shades gives a three-dimensional nature to the very 'busy' cockpit interior with a good impression of depth, while the dry-brushed details are picked out in a subtle manner that looks convincing and not too stark.

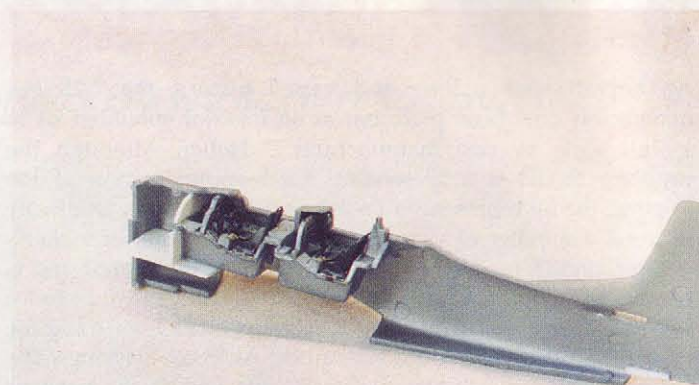
PREPARATION FOR TAILHOOK INSTALLATION

Before installing the completed 'bathtub' into the fuselage and before the fuselage assembly, I first cut away the lower rear fuselage and lower rudder where the tailhook will ultimately be installed. If you are modelling a non-tailhook equipped aircraft then this of course is not necessary, but it is vital for a model of the US

Navy-operated T-28C. The forward end of the cut was made with a razor saw, approximately 11.5mm ahead of the rudder hinge line and sloping slightly backwards. A cut was then made with a sharp knife parallel to the original lower fuselage shape right back to the rear of the rudder. Each fuselage half was treated in turn in this way. On the left-hand fuselage half the heavily scribed access door just ahead of the rudder hinge line should be filled and re-scribed to give a smaller access door between the new lower fuselage line and the horizontal tail attachment. The rudder hinge line should have a new 'triangular notch' scribed onto it just above the new lower rudder edge.

INSTALLING THE COCKPIT INTO THE FUSELAGE

The completed cockpit 'bathtub' was simply cemented into place onto the moulded attachment lugs inside the right-hand fuselage half. The T-28 model needs a lot of weight



Installing the completed cockpit bathtub into the fuselage half.

in its nose so that it can stand on its undercarriage. To accommodate this I built a simple floor and bulkhead from 15-thou plastic sheet just ahead of the 'bathtub' when the latter had been installed and allowed to dry. Note that this area for the necessary weight cannot extend downwards beneath the line of the cockpit floor because when the wings are installed the integral front undercarriage bay moulded on the lower wing piece enters the fuselage to sit just under the cockpit 'bathtub' forwards to the front of the fuselage structure. I packed the compartment created by the plastic sheet bulkheads with flattened lead shot pellets normally used for air rifles. The kit's instructions state that nine grams of weight are needed in the nose, and this approximates to 23 pellets of the lead shot that I use. However, if you also employ lead in this way, *always* ensure that it is kept away from animals and children, and *always* wash your hands after handling it – these are some necessary precautions during model making. Before adding the weight I cut away the Fennec air intake on the top of each fuselage half ahead of the windscreen position, and cemented some scrap plastic as a backing to the resulting hole so that it could be filled later. I also stuck a piece of thin plastic into the rear fuselage just above the cut-out made for the tailhook, so that when the fuselage sides are joined this forms the base for filler needed to fill in the gap in the centre of the new lower rear fuselage caused by the earlier surgery.

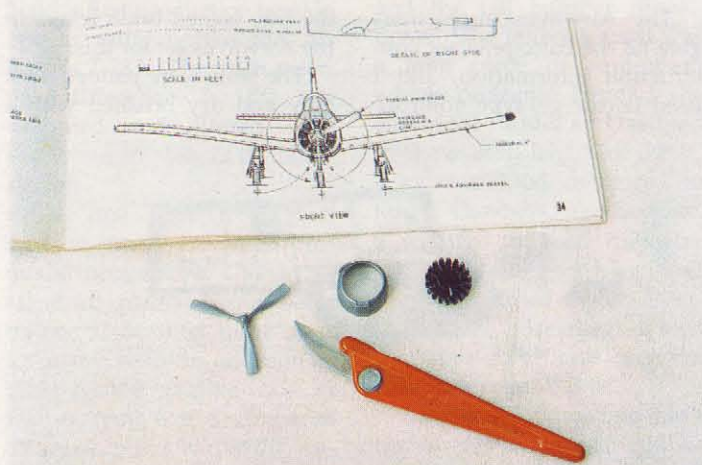
The fuselage sides were then cemented together and left to dry.

THE ENGINE AREA

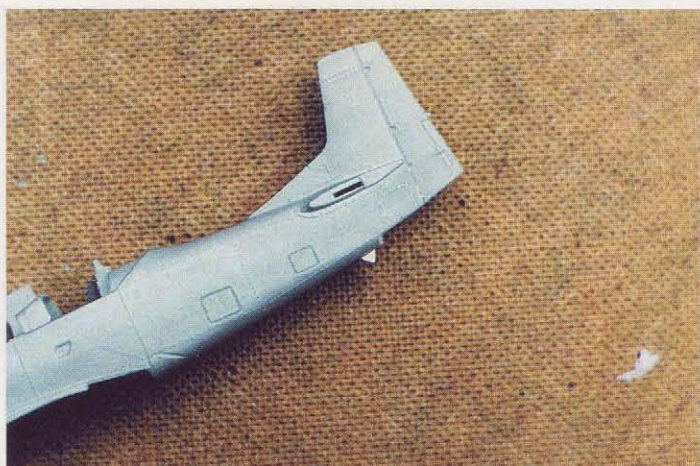
Turning attention to the engine/forward cowling, the Heller kit's engine was painted black and then 'weathered' with various shades of dark and mid-grey to highlight details. I duly fixed the engine into the forward cowling piece, lining up a moulded pip on the front of one of the cylinders with a small depression inside the cowling piece. I left the propeller off at this stage so that it could be painted at leisure and would not be broken during the following stages of construction – it was eventually added when the model was virtually complete. This means that a new shaft from plastic rod needed to be fashioned later for the propeller assembly, as the kit's shaft is intended to be mounted from behind through the engine before the forward cowling is fitted to the fuselage. The T-28C had slightly reduced length propeller blades, so I cut off approximately 1.5mm from the end of each blade and then carefully restored the slightly rounded shape of the tips and airfoil section. The basic colour of each blade is black, with the tips on the front face in white-red-white, and tip on the rear face in yellow.

TIDYING UP THE FUSELAGE

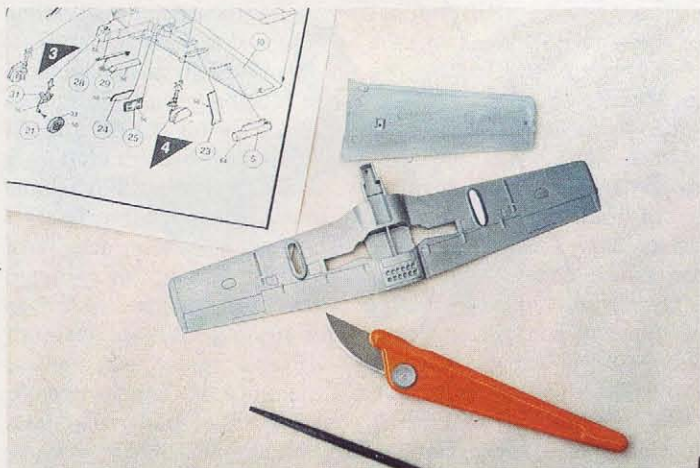
When dry the fuselage assembly was worked upon, cleaning up joint lines where necessary and filling the hole



The engine and propeller receive attention: the T-28C's three-bladed propeller featured slightly shorter propeller blades than those of the Fennec.



Tidying up the rear fuselage area.



The kit's wing pylons need to be removed for the T-28C. Work on the wheel wells will strengthen the wing assembly.

ahead of the windscreen where the Fennec air intake used to be in order to create a smooth sweep along the top of the fuselage in that area. The untidiness created by cutting away part of the lower fuselage for the tailhook was also filled where necessary and tidied up, and a new tail bumper was installed from scrap plastic just ahead of the tailhook cut-out. The engine/forward cowling assembly was then cemented to the fuselage. The joint lines around the back of this cowling piece when it has been added to the fuselage should be filled and sanded smooth, because the cowling panels on the rear aircraft were *not* of the contours suggested by the rear edge of the kit's cowling piece – the kit part is merely cut at that point for moulding convenience and really just represents the forward part of the whole cowling structure.

PYLON REMOVAL

The innermost, large wing pylons moulded integral with

the kit's lower wing piece are a problem if, like me, you need to remove them for the particular Trojan you are modelling. They are shaved off easily enough with a large file, but result in a big elongated hole in the wing. After cleaning this up I filled it by fixing a backing piece of 10-thou plastic sheet behind the opening inside the wing for each hole, and then stuck a piece of 20-thou plastic sized roughly the shape of the opening against the backing plastic into the hole. When dry any gaps around this plug were filled and then the whole lot was filed and sanded to restore the true shape of the wing undersurface. The small moulded outer pylons were also filed away.

The wheel wells also need some work. On the kit's mouldings they are theoretically 'boxed in' with moulded walls on the lower wing piece, but these walls are not deep enough to enclose the main wheel wells when the upper wing pieces are in place, and

therefore need to be deepened with scrap plastic that is cut to the shape of the already-moulded stub main wheel well walls. Determining the thickness needed to cause the walls to contact properly with the upper wing pieces is a trial and error process, but properly 'boxing in' these wheel wells gives strength to the wing structure and also looks more authentic. The front undercarriage wheel well does not require any work.

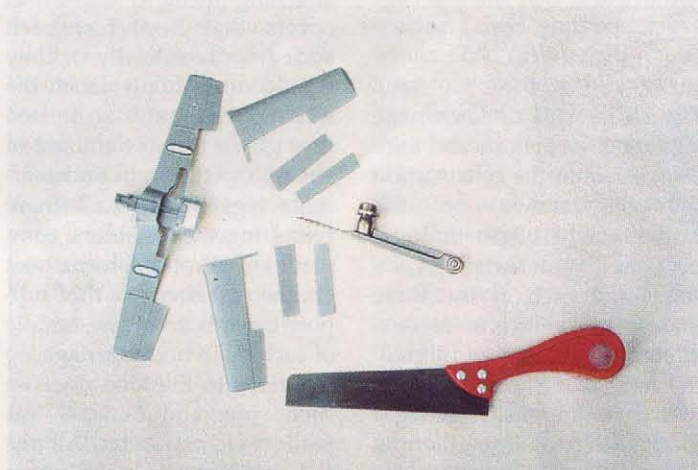
DROPPING THE FLAPS

Having decided to droop the flaps, I cut these from each wing piece by scoring along the moulded channels that represent their edges with a sharp compass point and then gently breaking them away. A small amount of wing root extending back to the full trailing edge was left at the innermost extremity next to the fuselage on each upper wing piece. Take note of the points at which the three flap hinges on each side underneath are

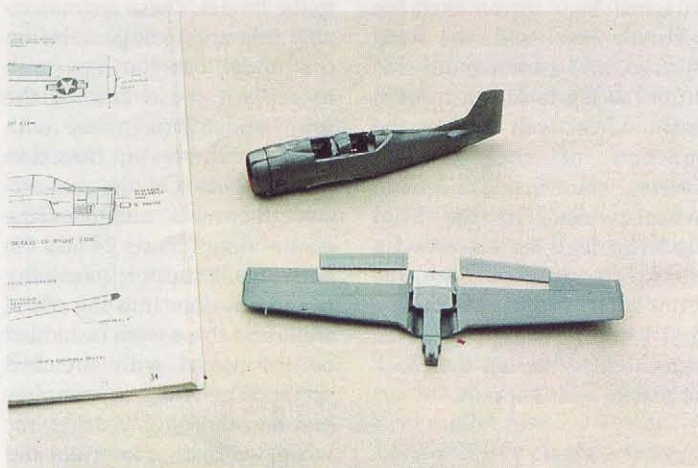
moulded on the kit's lower wing piece: these should be added with scrap plastic after the flaps have been affixed to the model in the down position. I also drilled out the section in the centre of the lower wing piece just behind the main wheel wells where the speed brake fits, as I intended to fit the Airwaves etched brass speed brake in the down position later on. The resulting hole in the lower wing piece was backed with a suitably shaped sheet of 10-thou plastic.

WING ASSEMBLY

The upper wing pieces were simply stuck to the lower wing piece. The boxing in of the wheel wells earlier actually gives extra strength to the wing structure – especially useful with the flaps removed. The flap sections themselves, separated in the previous stage, were also cemented together at this stage, after removing about 1.5mm of the whole leading edge of each



Careful surgery is required to remove the flaps from the wings.



Wing assembly – undercarriage wheel wells have been boxed in and give extra strength.

lower flap piece only, to facilitate its later fitment to the rest of the wing. With the upper and lower pieces of each flap cemented together, each flap should be slightly wider on its lower half compared to its upper half.

MATING WING AND FUSELAGE

The wing assembly was then cemented to the fuselage assembly. It has to be located carefully to correctly position the front undercarriage wheel well inside the suitably-moulded cut-out in the lower front fuselage. Some filler was needed at the resulting wing-to-fuselage joints when the whole assembly had dried.

TAILPLANES

The horizontal tailplanes were now added, lining them up carefully from the front in relation to the wings, and from above to avoid one being slightly further forward than the other. A little filler was found necessary when they had dried.

UNDERCARRIAGE IMPROVEMENTS

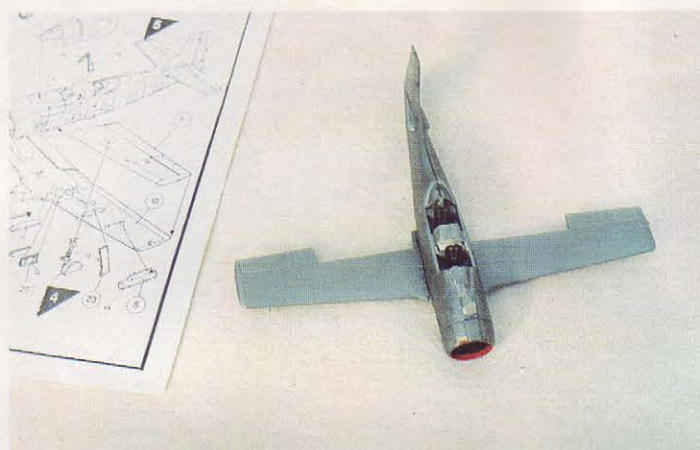
The Heller kit's undercarriage legs are quite delicate and thin. Straying from the construction sequence shown on the instructions, I began building up the undercarriage by cementing each of the three undercarriage legs in place – after first shortening slightly the axle that protrudes from each main undercarriage leg. I then added a strengthening support from thick plastic for each main undercarriage leg, attached high up on each leg virtually level with the wing surface, and running inwards from the leg to attach to each main wheel well roof at the junction of the wing-to-fuselage joint inside the main wheel wells. For the front undercarriage leg I attached a block of scrap plastic into the front wheel well beside the leg and touching it so that when cemented to the leg the block of plastic adds support.

COMPLETING THE UNDERSIDE AND FLAPS

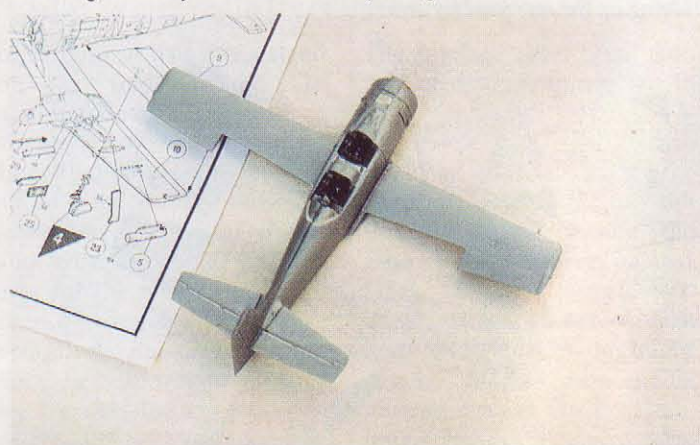
The rest of the undercarriage was then built up and the flaps

added. First I fixed the wheels. Remembering that most T-28C Trojans had a smaller nose-wheel, I reduced the diameter of the kit's nosewheel by filing before installing it. When all three wheels had dried I push-fitted the separate flaps in place (as shown in the accompanying photograph) to check that the kit's undercarriage provided them with sufficient clearance from the ground when they are in the down position – it does.

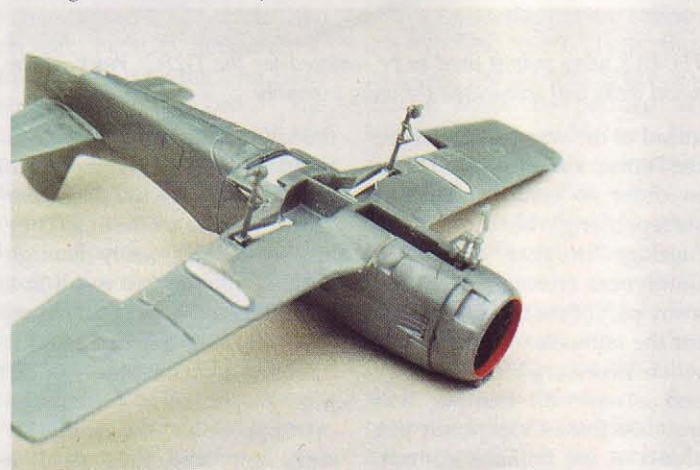
I then constructed the rest of the undercarriage, commencing by using the main wheel covers provided in the kit (Parts 26 and 27) – these were attached to the main undercarriage leg axle that protrudes through each main wheel – the reason that this axle was slightly shortened in the previous stage is to ensure that each wheel cover fits very close to its respective wheel. I then attached the long doors (Parts 22 and 23), first cementing each to the wing at the end of each main undercarriage well before attaching them to the wheel covers that have just been added. Technically, they should not actually touch the wheel covers but if so treated they give a massive amount of strength to the main undercarriage legs because all these pieces together form one complete and strong construction. On the real aircraft a thin support extends from the middle of each main undercarriage leg outwards to the long door on each side, and I added this with stretched sprue. All the remaining undercarriage doors from the kit were then attached to the model. These are reasonably thin and look passable on the model, but you may wish to replace those around the front undercarriage bay with thinner members cut from thin plastic sheet. On the real aircraft the main undercarriage central doors (Parts 24 and 25) had small supports running from each door into the wheel wells and these were fashioned on the model with stretched sprue. When all was complete and had thoroughly dried, the wheel wells, door interiors and undercarriage legs were painted white, with the leg oleo members in shiny silver. The



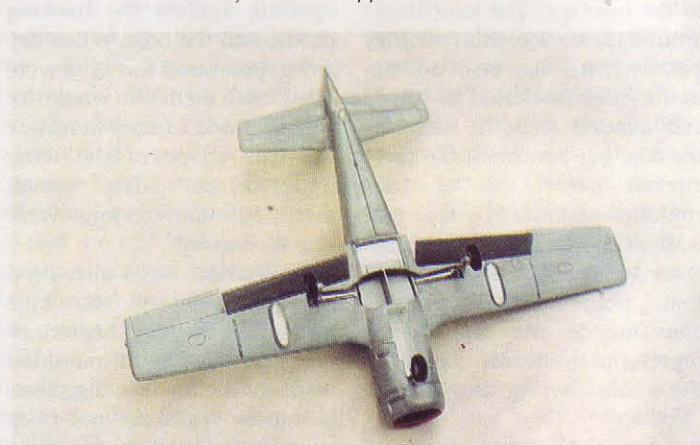
The wing assembly is attached to the fuselage.



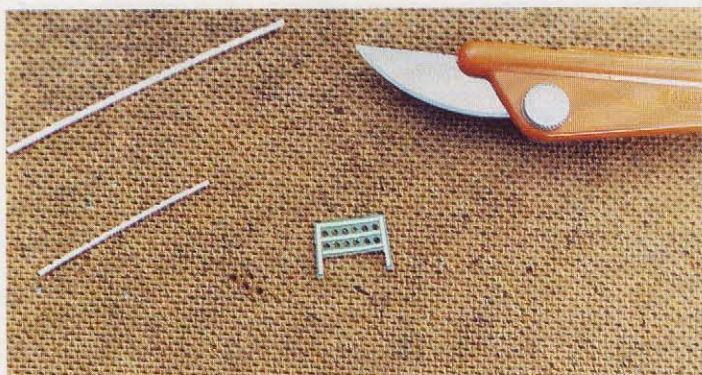
Adding the horizontal tailplanes.



The undercarriage legs provided by the kit require a small amount of work in the axle area before extra support is added.



The remainder of the undercarriage is added and the flaps push-fitted to check for ground clearance.



Detailing the Airwaves speed brake.

legs were then 'weathered' with a wash of thinned dark grey paint to simulate wear and to highlight details.

The flaps were subsequently cemented in place. They fit so that the leading edge of the slightly wider lower surface goes right up into the wing (in similar fashion to the real aircraft when the flaps are down), leaving the whole of the leading edge of the upper half of each flap just in contact with the rear edge of the flap cut-out in the upper wing piece. The photographs of the completed model elsewhere in this article show what this should look like when viewed from above and the rear. It's trial and error to get this exactly right, and I had to perform some work with a file to achieve the correct fitting. Reference to pictures of the real aircraft is particularly useful here to ensure that the model looks right when the flaps are in place. The flap hinges can then be added when the flaps have dried.

ADDING THE AIRWAVES SPEED BRAKE

The etched speed brake in the Airwaves detail set and the

tailhook were attached next. Before working on the speed brake I bent it slightly across its width to resemble the contours of the lower fuselage where it fits when retracted, and I then built up a frame on its inner face from strips of 10-thou plastic sheet to resemble the real aircraft's speed brake construction. The speed brake was then painted white on its inner and outer faces together with its well, and this neat little unit was attached in the open position to the model with superglue, hinged down from its forward extremities. Small support arms (as on the real brake) were then added from stretched sprue, running from roughly the centre of each side edge up into the well. Again, reference to pictures of the real aircraft are useful for the precise details.

The tailhook was made up using a white metal tailhook from Aeroclub Models (set V003). This had to be lengthened with plastic rod to make it long enough – the tailhook should protrude approximately 7mm from the rear edge of the rudder, making it approximately 28.5mm long in total. It is attached to the model at the

front end of the cut-out made earlier in the lower part of the rear fuselage and had two small supports beneath the fuselage in the cut-out on the centreline just ahead of the rudder hinge line to stop it from contacting with the lower fuselage and rudder and to hold it in place. The supports were added with tiny pieces of scrap plastic before the tailhook was attached. The tailhook should be painted in black and white stripes.

FITTING THE CANOPY

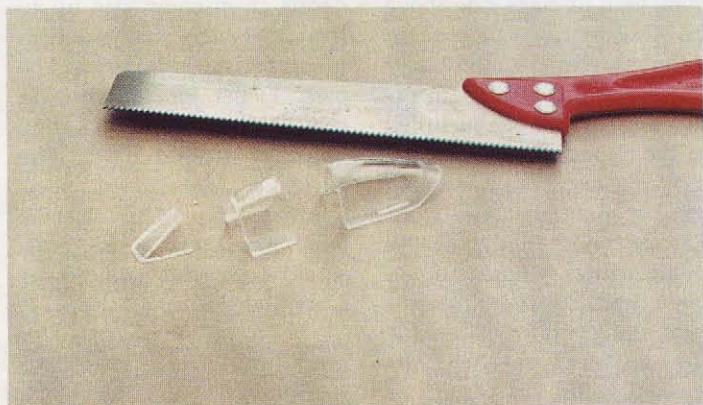
Having decided to model the cockpit covers in the open position, I was faced with dividing Heller's cockpit transparency into three pieces. Luckily the division lines are identifiable on the kit's canopy, and I very carefully sawed down the lines with a razor saw. The canopy frames were then painted, first in mid-grey so that this correctly shows through onto the inside of the canopies to give an impression of the internal framing, and then white was applied over the top. I then attached the windscreen to the model with Kristal Klear, first painting the cockpit forward combing beneath where the windscreen fits on the fuselage in mid-grey, but left off the two 'moving' parts of the canopy until after the model had been painted. The kit's rollover frame, Part 14, was deleted completely.

FINAL PAINTING AND DECALING

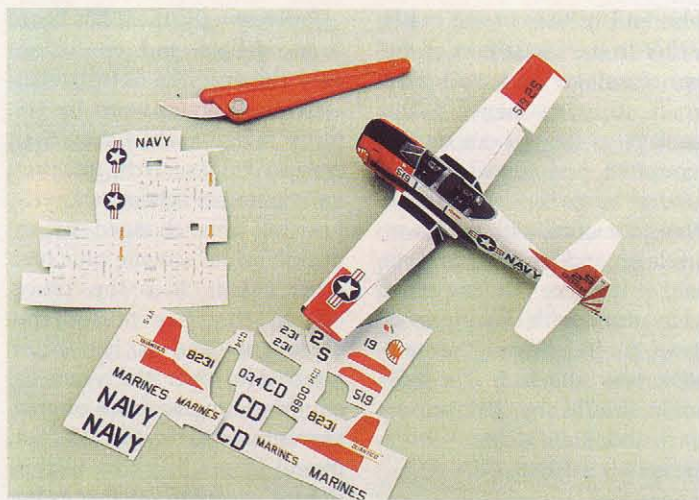
With construction just about complete, I commenced the paintwork by thoroughly cleaning the model with soap and water and then giving it an overall coat of airbrushed matt white paint when it was completely dry, having masked the undercarriage, cockpit, windscreen and front of the engine. This white coat revealed any blemishes, particularly around the wing roots, that needed further filling, acted as a key to the paint that was to follow, and also started to cover the silver-grey plastic which was to need several more coats of paint before its dark shade finally disappeared.

Interestingly, there has been some debate and confusion over the years as to just what were the colours worn by US Navy T-28s – when they first entered USN service, the prevailing trainer scheme was yellow but this changed to an overall white scheme plus one other colour. It is the 'other colour' that has caused the argument, and it has been referred to over the years as anything ranging from orange through red to dayglo! I do not intend to get involved in this debate, except to say that as far as those who were associated with these aircraft seem to agree, the actual shade when freshly applied was virtually a deep reddish-orange, and I usually achieve this by mixing five parts Humbrol gloss orange (18) with three parts Humbrol gloss red (19): this is the paint mix used on this model. However, do take care as I have on occasion noted a slightly different shade of orange emerge from two different tins of the same orange. For the white part of the colour scheme I used Humbrol gloss white (22), airbrushed in at least four coats to fully cover the shade of plastic. This was then masked and the red-orange mix airbrushed onto the nose and wingtips of the model: except that the upper left and lower right wing red-orange areas were neatly cut around the national insignia on the full-size aircraft, and to achieve this I first applied the 'star and bar' insignia to the model, and then carefully masked around its shape before applying the red-orange shade in these locations. The same was also true for the word 'Navy' under the left wing, which had a thin bar of red-orange in front of and behind it.

The decals for the model, including the national insignia, all came from the very colourful SuperScale sheet 72-323, which provides options for three US Navy machines plus a T-28 bearing US Marine Corps markings. I wanted to finish my model as T-28C BuNo 140068 '519', a classic trainer as flown by VT-5 for aircraft carrier qualification using USS



The Heller cockpit transparency can be divided into its component parts without too much difficulty.



The completed model was finished in the markings of VT-5 using decals from the SuperScale sheet.

Lexington. This aircraft had a distinctive red and white 'sun-burst' design on its rudder and an unusual sharkmouth on the engine cowling. All these markings are on the SuperScale decal sheet, but there are (surprisingly) several faults with the markings and details given. The most obvious is that the aircraft is drawn on the decal sheet's instructions as not carrying a tailhook, which is not correct – more seriously, due to this the sun-burst marking for the rudder is the wrong shape, as it is designed for the full rudder shape of the 'B model Trojan and not the modified rudder of the T-28C. To get around this I found it easiest to cut out each individual red triangle and to apply them individually in as near as possible the correct locations on the model's modified rudder, plus the small '19' on the rudder tip.

The decal sheet's instructions also show this aircraft as having only the extreme wingtips in the shade that I am referring to here for convenience as red-orange, whereas all the pictures that I have ever seen of '519' show it with full red-orange patches on the wingtips that extend well onto the wing surfaces.

A further problem with the decals relates to the code on the upper right-hand wing. The code given on the transfer sheet reads 714 followed by 25 (twenty-five). To begin with it should surely read 2S (two-S) as also carried on the aircraft's fin, but in any case the code '714' was surely worn by one of the other aircraft in the unit (actually BuNo 140631), and that '519' should carry the number 519 on its wing. Unless anyone can prove otherwise with definite photographic evidence, I placed the code '519'



Underside view of the virtually-completed model, showing the general layout of markings and equipment. The number-letter combination '2S' was made up with suitable markings from my spare decal box, as these were not included on the Superscale sheet otherwise used on this model.

REFERENCES

The two most valuable references in book form recently available on the T-28 Trojan are the Squadron/Signal *T-28 Trojan in Action* (no.89), and the relevant volume (No.5) in the *Naval Fighters* series by Steve Ginter.

USEFUL ADDRESSES

Most of the specialist products referred to in this article can be purchased from good model suppliers, or direct from the main importer or manufacturer. Airwaves detail sets come from ED Models, 64 Stratford Road, Shirley, Solihull, West Midlands B90 3LP. Aeroclub Models can be contacted direct at 5 Silverwood Avenue, Ravenshead, Notts NG15 9BU. My SuperScale decals come from Hannants, Trafalgar House, 29–31 Trafalgar Street, Lowestoft, Suffolk NR32 3AT.

followed by '2S' on the wing of my model, using one of the two large '519' decals on the sheet, and slightly changing the '25' found with the 714 code into '2S' by careful re-painting. The other large '519' decal was placed below the left-hand wing just ahead of the main wheel well, the two smaller '519' markings on the sheet are utilised on the white panel just forward of the cockpit on each side of the fuselage. The two '19' decals on the sheet are placed on the lower flap surfaces on the outer end of each flap.

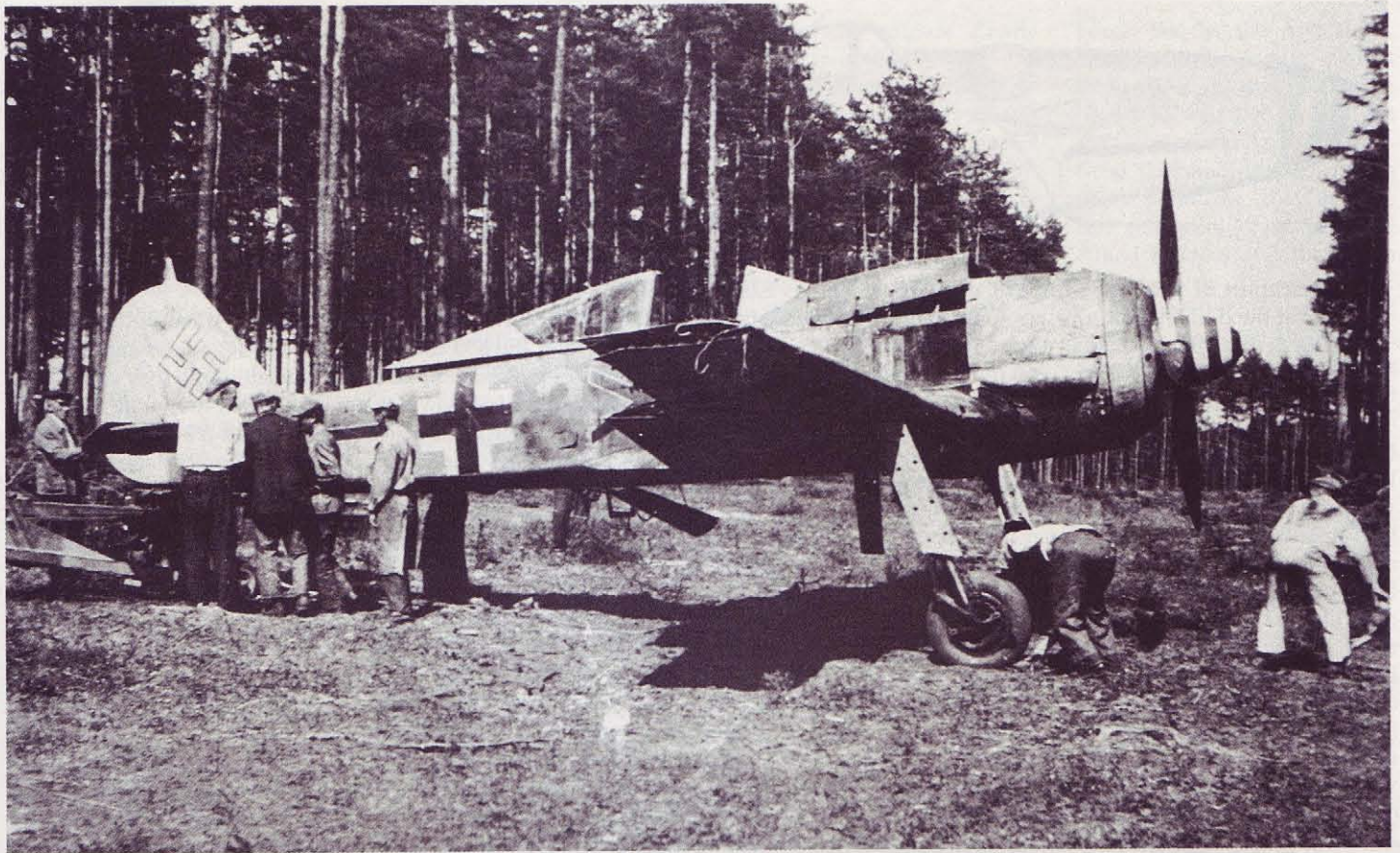
The anti-glare panel ahead of the windscreen and extreme nose were both painted matt black. The front end of the left-hand wing-tip was painted dark brownish-grey. The SuperScale sheet does not provide the prominent wing walkway markings that were on the wing close to the fuselage, and so I cut these from a solid black transfer sheet; the two thin black lines extending down from the cockpit on the left side also came from this source. The wide 'exhaust stain' marking which features along each fuselage side above the wing root was painted on with dark grey (Humbrol matt 32). A wealth of small markings and stencils are included on the SuperScale sheet and I applied some of these as a final act (but note that the word 'Rescue' on the little yellow rescue arrows is upside down when applied pointing forward to the port fuselage side). The model was then air-brushed with satin varnish to seal in all the decals and give a uniform overall finish, except

the matt black anti-glare and grey 'exhaust stain' areas, masked off during this process (as were the cockpit area, engine front and undercarriage). I usually use Humbrol satin varnish (the type that comes in a glass container and is usually referred to as Satin Cote).

To complete the model I added the cockpit canopies in the open position when the paintwork had thoroughly dried using Kristal Klear, and to finish the propeller was finally installed.

The end result is a very striking and eye-catching model. I am particularly pleased that I decided to drop the flaps, as this gives the model what I feel is the right 'look' when displayed. The combination of red-orange and white paint plus the shark-mouth give the model a most distinctive appearance. I was surprised by the difficulties encountered by the SuperScale markings, as these are usually of very high quality but although the instructions left something to be desired, the quality of the printing of the decals themselves was up to the usual high standard with no off-register print work. The basic Heller kit modelled in this article represents good value at around £2.95. The Airwaves detail set costs approximately £4.99, and the SuperScale sheets are £3.95 per set. The Aeroclub tailhook set costs 60 pence.

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Unternehmen Bodenplatte – Operation Baseplate

Barry Ketley reviews the Luftwaffe's Big Punch

In December 1944 the Allied armies were pressing hard on the shrinking perimeters of the Third Reich. In the west, the east and the south, enemy troops were close to or over the borders of Germany, yet, bolstered by imaginative propaganda describing the consequences of unconditional surrender, the German armed forces resolved to fight to the end.

None of the new weapons introduced into the Luftwaffe had made even a dent in the air superiority established by the Allies. Yet, even after the devastating losses of the summer, the Luftwaffe fighter force had staged a remarkable recovery. By concentrating its forces it was once again in a position to deliver one or more spectacular ripostes to the enemy.

Following the failure of the fighter force to blunt the daylight attacks on the homeland, *Generalmajor* Adolf Galland, Luftwaffe Inspector of Fighters, decided upon the need for a radically different defensive response. Exploiting the lull in operations caused by

the weather in autumn 1944, he seized the opportunity to withdraw several units from action to airfields in central Germany where they were re-formed and given essential retraining. By this means he assembled a large force of fighters for an operation to be known as *Der Grosse Schlag* – 'The Big Punch' – for a single crushing attack on the American bombers. This was to be delivered at a time and place of his choosing. In essence, no fewer than 2,000 fighters were to engage the bombers on their way to the targets. After refuelling and rearming it was expected that about 500 would then take off to engage the bombers again during their withdrawal. While this was happening night fighter units would be moved into positions where they could intercept damaged bombers seeking refuge in Switzerland or Sweden. The hope was to shoot down between 400 and 500 bombers in a single day, at an estimated cost of some 400 German fighters and 100-150 pilots. This

would not have won the war, but it would have bought time for newer weapons to be deployed and given some relief to the hard-pressed homeland. The shock of such enormous losses would, it was also hoped, cause a pause in the Allied air offensive.

In fact, by November 12, 1944, eighteen *Jagdgeschwader* and over 3,000 aircraft and pilots had been assembled and were awaiting the Big Punch. All now depended on the weather – and the Führer.

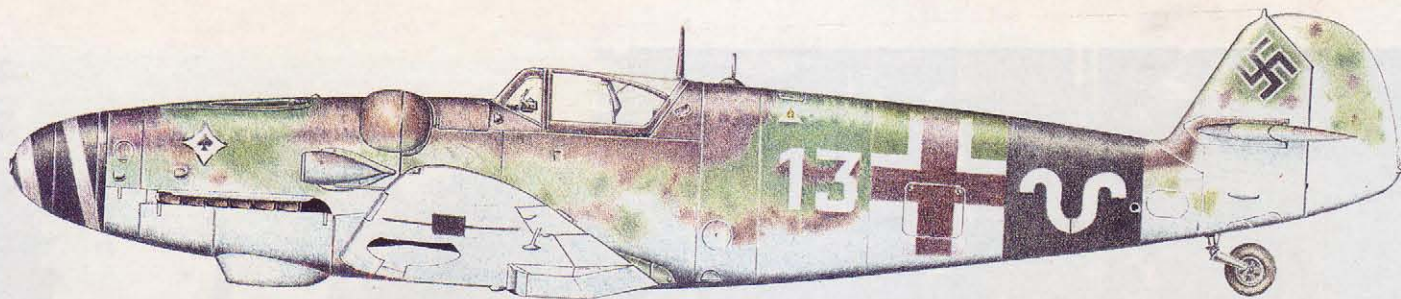
Looking at the available evidence, it seemed to Hitler that there was a strong possibility that the Big Punch might suffer heavy losses without securing decisive results. If so, he had another use for the fighters so painstakingly assembled by General Galland.

On the ground, despite the dreadful casualties endured by the German army in the summer, it had made a astonishing recovery and was still a force to be reckoned with. Always looking for an opportunity for the massive offensive blow

which would deal with his enemies at a stroke, Hitler had his generals produce plans for a counter offensive in the west involving some 200,000 men including 7 *Panzer* divisions. The operation was code named *Wacht am Rhein*, 'Watch on the Rhine', and the focus of the attack was to be the weakly held American sector of the western front in the Ardennes.

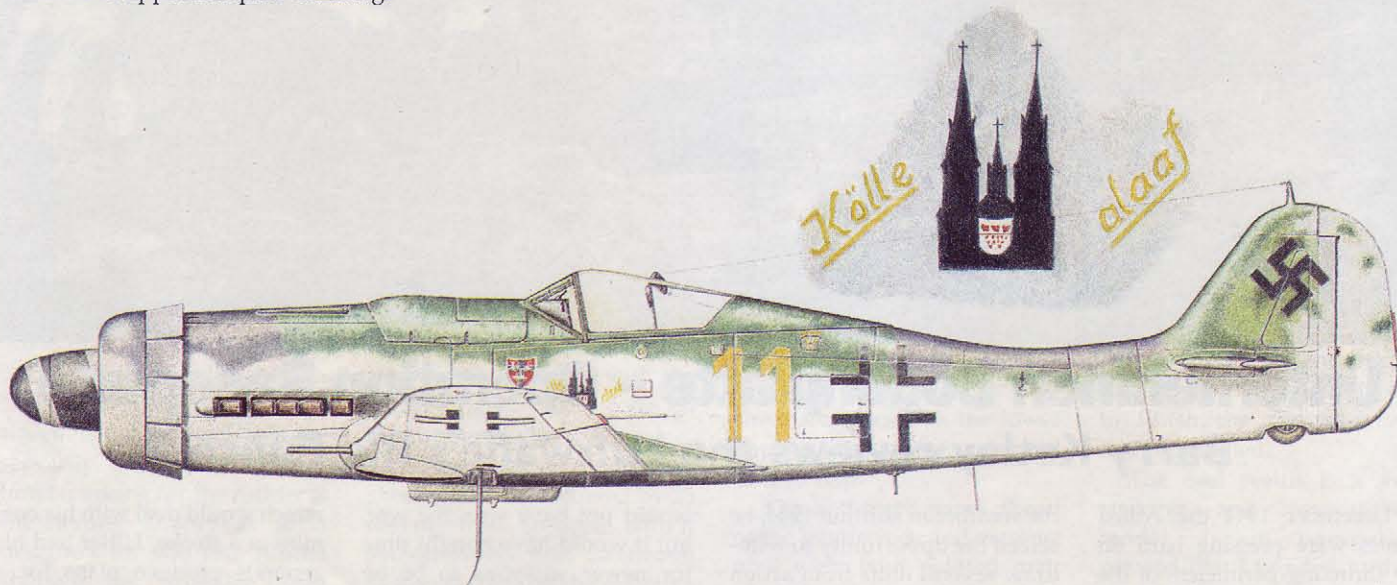
The task given to the Luftwaffe in 'Watch on the Rhine' was fourfold:

- A large-scale surprise attack on forward Allied airfields to be coded *Unternehmen Bodenplatte* (Operation Baseplate).
- Establishment of air superiority over the battlefield.
- Close air support to assist the advancing troops.
- A small airborne operation to secure the important road junction at Malmedy through which American reinforcements would have to pass.



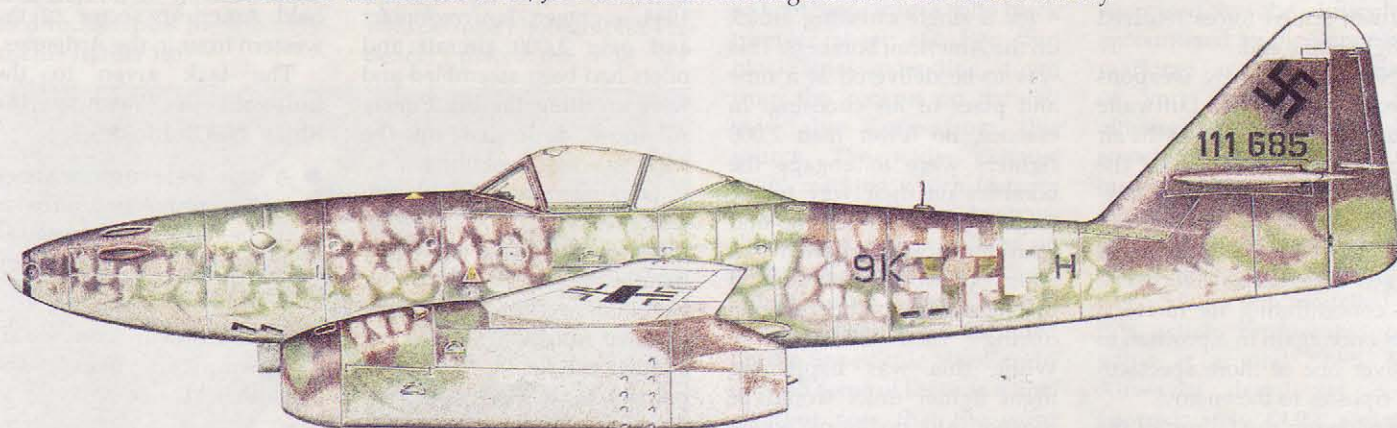
Messerschmitt Bf 109G-14, white '13' of IV/JG 53 Pik-As based at St-Echterdingen.

Typical of the dull late-war finishes forced on the Luftwaffe by the need for concealment from the ever-present Allied fighters, this machine is probably finished in a combination of the RLM colours 81 Brown-Violet and 83 Dark Green. The fuselage sides are a fairly solid mottle of the two colours with the possible addition of 02 Grey. Undersides are probably 65 Light Blue although they could be one of the greenish 'sky' colours noted by some authorities. As another way of toning down the overall finish the white outline crosses on the fuselage have been filled in with 81 or 83. Unit markings consist of the black Reich defence band allocated to JG 53 and the Ace of Spades emblem on the cowling. The number '13' and 4th Gruppe wavy bar are also white, the number showing up against a patch of paint where another number has apparently been obliterated. By contrast, the white spiral on the black spinner must have appeared quite dazzling.



Focke-Wulf Fw 190D-9 flown by Unteroffizier Günter Rey of 11/JG 54 based at Furstenau. 1 January 1945.

Yellow '11', one of the earliest batches of the long-nose Fw 190 had a Werk Nummer in the 210xxx series and was built by the Focke-Wulf plant at Cottbus. Probably finished in 83 Dark Green and 75 Gray-Violet on the upper surfaces with a light mottle of 81 Brown-Violet and 83 on the fuselage sides, with 76 Light Blue undersurfaces. Newly delivered to the 'Greenhearts' from the factory just in time to take part in Bodenplatte, there had been no time to paint the blue fuselage band allocated to JG 54, although the pilot had managed to get his personal emblem showing the outline of Cologne Cathedral and the motto Kölle alaaf added. The small shield under the windscreen is the emblem of III/JG 54. National markings are all of the outline variety.



Messerschmitt Me 262A -1a/Jabo, Werk Nummer 111685, 9K+FH of 1/KG (J) 51 'Edelweiss.'

I/KG 51 participated in Bodenplatte by sending 21 Me 262s to raid Eindhoven and 's-Hertogenbosch in Holland. The Me 262s led the way to the airfields where two were claimed to have been shot down. It is not certain that the machine shown here, white 'F', actually took part in the raid, although it definitely survived until May 1945. Seemingly finished on the fuselage in a strange pattern of light coloured blotches, possibly 02 Grey, over the base colours of 81 Brown-Violet and 82 Bright Green, with undersides in 76 Light Blue. Other machines in the unit were finished in a streaky squiggle pattern. The rudder appears to be a solid coat of 81, probably finished at a distant component factory. Note how the staffel colour of white has been applied to the nose and fin-tip, partially overlapping the swastika. National markings are standard outline type, white on fuselage and upper wings with black swastika and under wing crosses.

The protests of Galland and the other Luftwaffe commanders that the pilots had received training totally different to that which was required for close-air support operations from forward airfields were ignored and so by mid-December the units assembled for *Bodenplatte* had moved to their forward bases amidst radio-silence.

On the 14th the commanders of the units were summoned to *II Jagdkorps* headquarters and told that their targets were 16 of the most important airfields used by the Allied fighters and fighter-bombers in France, Holland and Belgium.

On the 16th the great gamble began with a massive artillery bombardment – but the signal to commence *Baseplate* never arrived. The weather had come to the aid of the Germans in the form of freezing fog and mists which effectively grounded the aircraft of both sides. The Battle of the Bulge had begun.

By 20 December the German advance had run out of momentum as hardened American reinforcements arrived. On Christmas Eve clear skies meant that airfighting could be renewed and as German units were fed piecemeal into the battle, losses began to mount and the precious reserves built up for the Big Punch began to be frittered away.

At this stage most Luftwaffe commanders assumed that *Baseplate* had gone the way of many other grandiose German plans and been quietly forgotten. Their surprise was all the greater then when the signal triggering the operation was flashed to them on the afternoon of New Year's Eve 1944.

The attack was to be launched soon after first light the following morning. The aim of the operation now was to simply regain control of the Western airspace by breaking Allied fighter superiority in order to be able to mount an effective defence against the bomber hordes. However, the operations of the previous two weeks had extracted a toll and there were now only some 900 fighters available. Not as many as originally intended, but still a sizeable number.

It is widely assumed that the choice of New Year's Day was governed by the hope that the previous night's celebrations would have dulled the Allied response. This would be helpful, but the main factor was the weather. Clear skies were predicted over the enemy airfields on the morning of 1 January 1945, and so the order was given imposing an early night and cancelling all celebrations by the German fighter pilots.

Under complete wireless silence all wings will fly low over the frontier simultaneously in the early hours of the morning to take the enemy forces by surprise and catch them on the ground. Units will receive air photos of the targets allotted to them and will use these to brief every pilot in detail.

So read the operational instructions from *II Jagdkorps*. In the time available and in the chaotic conditions prevailing this was totally unrealistic, and many pilots were still unaware of what it was all about when they took off. To assist in the route-finding one or two night fighters were allotted to each *Geschwader* as pathfinders, although they were not to take part in the operation itself.

At 05.00 in the morning of the first day of 1945, the pilots were roused and given final briefings. As ten *Jagdgeschwader* composed of 33 *Gruppen* waited for the order to go, the final order arrived – 'Operation Hermann, 1/1/45, time 0920.' The codewords signified that all aircraft were to begin the attack at nine-twenty. By 09.00 the first aircraft were airborne and heading for their rendezvous points.

They were not to know that things had already gone disastrously wrong, for the German flak batteries – over which the massed formations had to fly on both the outward and return journeys – had in many cases not received warning of the operation. Their natural and immediate reaction after months of overwhelming Allied air superiority was to open fire on such large numbers of aircraft. The results were catastrophic. German sources estimate that about 100 aircraft were lost to their own flak.

When the raiders finally arrived over the Allied airfields, they achieved complete surprise almost everywhere. One of the most successful attacks was at Eindhoven, carried out by *II* and *IV Gruppen* of *JG 3* flying Messerschmitt Bf 109s of various models. The German force arrived over Eindhoven just as the Typhoon fighter-bombers of 438 and 439 Canadian Squadrons were taxiing out on an operation. Within minutes most of the aircraft in the two squadrons had been destroyed or severely damaged, other units on the airfield suffering equally grievously. Effective attacks were also delivered at Brussels/Evère, Brussels/Melsbroek, St. Denis-Westrem and Maldegem.

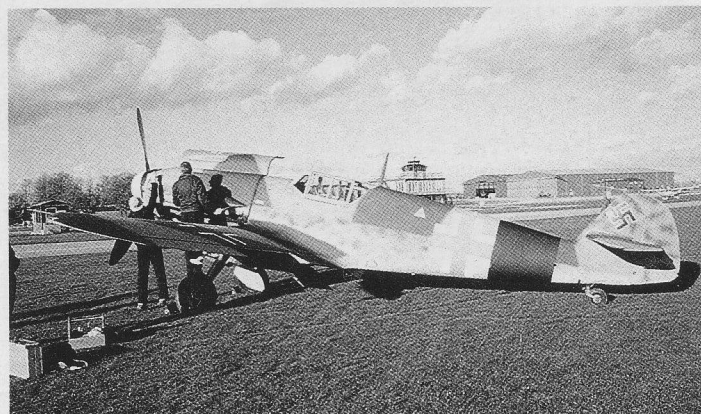
At other airfields, however, the story was rather different. In some cases the German units simply failed to locate their allotted target, in others, such as Grimbergen, inadequate intelligence meant that there were no worthwhile targets on the ground at the time, and in some cases there was so much confusion that the attackers got in one another's way. As a result, Antwerp/Deurne, Volkel and Le Culot, all regarded as primary targets, were noticeable failures. In yet other examples, airfields such as Ophoven and Knocke were hit by mistake.

The result of all this was that the Focke-Wulfs and Messerschmitts of the Luftwaffe succeeded in causing considerable confusion, and in some cases, substantial damage, mostly in the operational area of the British 2nd Tactical Air

Force, but as the first shock wore off increasingly violent and effective counter-action began to frustrate or disrupt the German attacks. As the battered remnants of the German units withdrew, they had to run the gauntlet of vengeful Allied fighters and their own flak again.

Argument still rages over just how great the Allied losses were, German sources claiming the destruction of some 500 machines, while Allied records put the number at 144 destroyed and 62 damaged beyond local repair. Whatever the numbers, the British and American losses in both men and machines were minimal and made good within two weeks. For the Luftwaffe fighter force, *Baseplate* was far and away the most costly operation it was ever to mount. Official figures have not survived, but from the remaining records it seems likely that over 300 German fighters were lost – one third of the force – and 237 irreplaceable pilots were killed, disappeared or were taken prisoner. A further 18 were wounded. The greatest loss was of experienced leaders, many of them *Experten*, men who could have made a significant difference in the battles over the Reich. Amongst them were three *Geschwader* commanders, six *Gruppe* commanders and eleven *Staffel* leaders.

After this disaster, the Luftwaffe could still fight back, but it had suffered a self-inflicted defeat from which it would never recover, and could never again hope to influence the final outcome of the air war over Europe.



The Imperial War Museum's Bf 109G-6 G-USTV recently donned a special colour scheme for a cigarette advertisement. Late-model Bf 109s played an active part in *Bodenplatte*. (Richard A. Franks)

AUSTRIAN WHORLED PRINTED FABRIC

by Ian Huntley

Reader Len Atkinson of Woolwich recently raised an old subject when he enquired as to whether any information had been published anywhere about a strange swirled-looking 1918 vintage Austrian camouflage, possibly of printed form, which was quite different from anything printed in Germany.

The answer is yes, principally in the excellent *Cross and Cockade* journal, but nothing of a conclusive nature has been widely published, the main reason being that no accurate clue as to the colouring of the fabric has yet been established. No real attempt even to draw out the pattern has yet taken place.

However, a long while ago in the late 1970s I received a letter from an Austrian researcher, Karl Schleich, who was engaged in the study of World War I hand-painted and machine-printed fabrics, and claimed that as far as the latter went there were more than just two or more German 'lozenge' fabrics.

Apart from single colour printing, or more likely dyed single colour material, Karl considered that other multi-coloured printed forms had been tried in Austria. He pointed out that it was time-consuming enough to hand- (or spray-) paint regular hexagon patterns onto metal, wood or fabric surfaces, and even more so to attempt irregular lozenge forms, so to attempt to hand-paint the 'whorl' design that he had discovered was almost an impossibility.

To illustrate his point he sent a small sketch of a whorl design in four colours although at the time no idea of the actual colours was known, though it was considered that they could be basically from the same number of stable dyes used in Germany. He drew attention that to effect an overall and fairly regular pattern of whorls was not really possible

on a large scale, and therefore the pattern must have been printed, possibly by a well-known curtain fabric producer in Vienna.

Mention of Austria brought to mind the specialist in the study of that country's aircraft, namely Dr Martin O'Connor (who has now sadly passed away), and I enquired whether the correspondent had been in touch, and if not, whether he ought to. Nothing more was heard on the subject until 1981 when Martin wrote a brief text explaining that the whorl fabric had definitely existed, certainly in a limited application, on a number of Austrian-built aircraft. Two photographs accompanied the text, illustrating the pattern. These had been taken around the mid-1918 period in the Oeffag Works and had evidently come via Peter Grosz who had unearthed them during an unrelated investigation.

The two photographs showed part of the uncovered wing structure of an Albatros D.III (Oef), set in front of a vertically supported length of printed linen. At that time Martin was keen for the photographs to be circulated to as many interested parties as possible so something more might be found out about the 'new' material. The photographs together with a set of notes then left my care and went on a circular tour which lasted some five years, returning in many cases with a few scratchy notes or with no notes or comments whatsoever.

As a result, a further set of notes was drawn up and the information was passed back to some of the pundits for further feedback.

AUSTRIAN CAMOUFLAGE VARIED WIDELY

Readers are doubtless fairly familiar with the somewhat differing camouflage schemes carried by Austrian flown



A sketch drawn by Karl Schleich of one of the several whorls which went to make up the pattern repeat. Several sketches were made in colour as suggestions for the probable colour scheme. Later photographs via Martin O'Connor proved such a printed scheme to be genuine.

aircraft during the 1914-18 period. Much more use was made of 'spatter', 'daubing' and hand-drawn patterns than on German aircraft of the same period. The style and positioning of national markings also differed, as did the aircraft type numbering and form. When it came to multi-colouring, large hexagonal patterns in several colours were probably the most commonly seen. But since the late 1970s there increasing evidence has come to light of full or partial covering of many machines with this whorled type of printed fabric.

Even so, the fabric seems to have mostly appeared upon Oeffag-built Albatros fighters as is evidenced by contemporary photographs. For example, Italian sources show Albatros D.III (Oef) 253.64, which was shot down on 28 August 1918 by an Italian Hanriot. Here the photograph shows the whole of the machine finished in the whorl fabric.

Further Swiss evidence records that in November 1918 two Albatross D.III (Oef) 253 series aircraft landed near Schlieren during fog and were interned. Both had the whorl fabric, with one (253.116) also having a large heart and arrow motif covering a large part of the each fuselage side. The other had less in the way of markings but showed the whorl fabric on its mainplanes and rudder. The latter machine was kept by the Swiss and used for flying training with the serial 611 while the former machine appears to have ended up in Czechoslovakia.

Martin O'Connor and other researchers have found lists of Albatros, Aviatik and Brandenburg aircraft purporting to have made use of this fabric when going through Austrian documents.

ESTIMATIONS

If the German lozenge designs were initially considered difficult to understand and

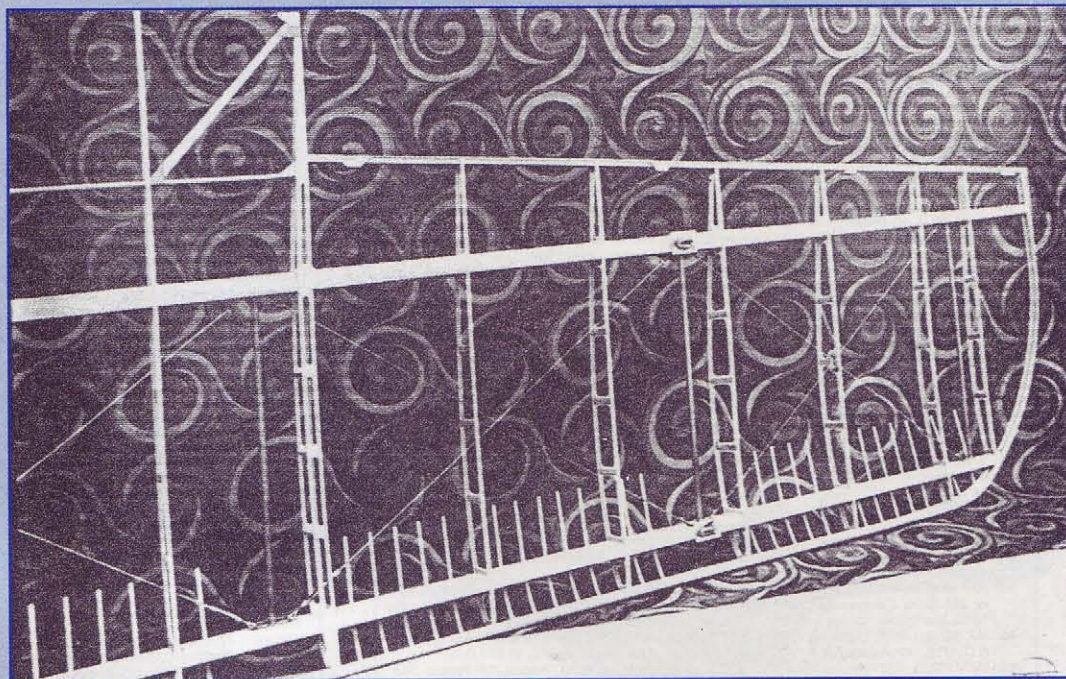
A photograph of the whorled fabric against the wingtip of an Albatros D.III (Oef) showing the width of the material to be between 64 and 66 inches. The three-column width of the pattern repeat can just be determined near to the actual tip.

appreciate, then this Austrian whorl design must be considered ten times worse. From what had been gleaned so far the fabric was some 64 to 66 inches in width and consisted of some seven and a half patterns, that is, seven complete patterns with a quarter-pattern at each selvedge. The pattern appeared to repeat lengthwise every third row along. As can be seen in the photographs, the whorls alternated both lengthwise and crosswise between complete and partially complete patterns. In monotone, only some four different tones can be distinguished, but whether it was precisely four or there were more is difficult to ascertain.

It is also difficult to say how the fabric looked when applied to a wing structure without creating the pattern drawn out to scale and placed against a scale wing. To appreciate its design fully one would need a photograph taken square on to a wing surface, rather than the usual oblique three-quarter ground shot where the pattern would be almost lost. Even on a rudder there was not enough area to get a feeling of the actual repeat of the pattern.

As to any colour in the whorls, several early mentions of them considered one shade to be green, possibly a light olive to sage green. In black and white photographs and with poor quality prints of the complete aircraft the whorl as a printed design was initially not easy to recognise, as so little tonal difference could be seen. From this early investigators

A close-up of the whorls, where the three-colour pattern can be more clearly seen. Even so, the dropped whorls are not easy to identify. Each row down may not be exactly similar in form, though it would appear that the repeats run on the diagonal.



considered that the pattern may have been of a darkish overall appearance. Some semblance of what was thought to be a series of overlapping hand-drawn spirals was detected, as could be made with a sponge. At this time stipple and splatter were commonly used means of applying colour.

OF DEFINITE PRINTED FORM

It appears that the only way to achieve such regularity in pattern of such a fine and complex design is by dye printing, but it is not known

whether there was more than one pattern in use and whether there was more than one set of colour combination in use, remembering that the Germans used light and dark forms of their lozenge fabrics.

Such dyes that might possibly have been used could have yielded the following colours which are given in colloquial terms and in Methuen notation: Prussian Blue 21F7; Light Olive 29E8; Terra Cotta 7D7 and Ochre 5(C-D)6.

As the original films used were of the non-colour sensitive or orthochromatic type much translation of the monotonous is needed to arrive at a

colour solution. The lightest tones could well be dark blue with the darkest being yellowish ochre – leaving terra cotta and green to come somewhere between the two. Certainly the visual colour pattern would be the opposite in colour weight to the black and white print. In fact, the print could almost be taken as a negative in that respect.

This whorl pattern is one of those nice unsolved aeronautical mysteries that will take much longer to get near to than lozenge fabric ever did. I would be delighted to hear from any readers putting forward further theories.



MODELDECAL DECALS

1:72nd
SCALE

A SELECTION FROM THE CURRENT LIST:

- 2 F-4 Phantom, late 1960s: VMFA-531 USMC, 497 TFS USAF, 767 Sqn. Royal Navy.
- 9 US Navy: A-1J Skyraider VA-175 1966, A-7E Corsair VA-195 1970, SH-3A Sea King 1967.
- 13 T-33A Luftwaffe 1968, Fiat G-91R/3 Luftwaffe 1969, F-104G Starfighter MFG1 1970.
- 14 RAF: Sabre F.1, 234 Sqn. 1954, Vampire FB.5 112 Sqn. 1951, Chipmunk T.10 2 FTS 1971.
- 15 A-7E Corsair VA-113 'Stingers' USS Ranger USN 1970, AV-8A Harrier VMA-513 USMC 1971-72, F-4B Phantom VF-111 USN 1971.
- 17 T-33 4th Wing RCAF 1967, F-35 Draken 725 Sqn. Danish Air Force 1971, Mosquito FB.6 4 Sqn. RAF 1949, A-4G Skyhawk 805 Sqn. Royal Australian Navy 1969.
- 26 RAF: Buccaneer S.2B 15 Sqn. 1974, Hunter FGA.9 58 Sqn. 1974, Canberra B.2 10 Sqn. 1956, Gazelle HT.3 CFS 1973, Royal Navy Gazelle HT.2 705 Sqn. 1974.
- 28 RAF: Canberra E.15 98 Sqn. 1974, Lightning F.3 29 Sqn. 1971, Jet Provost T.5 3 FTS 'The Swords' 1974, Royal Navy Hunter T.8 754 Sqn. 1964.
- 31A (Slightly revised earlier set 31), H. Fury 1 Sqn. B. Bulldog, 23 Sqn. Siskin 43 Sqn. Gladiator 87 Sqn. plus fuselage squadron numbering for use with set 108.
- 33 British a/c post-war serial letters (black): 16 in, 18 in, 20 in and 24 in heights.
- 34 British a/c post-war serial letters (black): 30 in, 36 in and 48 in heights.
- 35 British a/c post-war serial numbers (black): to be used with sets 33 and 34.
- 37 RAF: Phantom FGR.2 56 Sqn. 1976 or 30 Sqn. 1971, Sabre F.1 20 Sqn. 1955, USAF F-111E 20th TFW 1976 in full Bi-Centennial markings, L'Armee de l'Air Mirage IIIE E.C.2/4 1976, L'Armee de l'Air CM170 Magister with several options included.
- 39 WW2 British roundels and fin flashes, types A and A1. Type A diameters 25, 30, 35, 40, 42, 45 inches. Type A1 diameters: 20, 28, 30, 34, 35, 42, 45, 45 1/2 inches. Fin flash widths: 15, 18 and 21 inches.
- 40 WW2 British roundels and fin flashes, types A, A1, C, C1. Type A diameters: 45, 50 inches. Type A1 diameters: 49, 56 inches. Type C diameters: 40, 63 inches. Type C1 diameter: 48 inches. Type A fin flash widths: 9, 12, 24, 27, 36 inches. Type C width: 24 inches.
- 42 British WW2 roundels, type B. Diameters: 15, 25, 30, 32, 35, 40, 44, 48, 50, 54, 56, 59, 63, 66 1/2 inches.
- 43 RAF: Jaguar GR.1 41 Sqn. 1977, Jaguar GR.1 20 Sqn. 1977, JASDF F-4E/J Phantom 301 or 302 Sqn. L'Armee de l'Air F-84F Thunderstreak E.C.1/19 1961, Dutch A/F F/TF/RF-104G Starfighter, choice from either 306 Sqn. V1bVKL or 'Dutch Masters'.
- 45 IAT 1977(1), RAF: Lightning F.3 or F.6 11 Sqn. Hawk T.1 CFS, L'Armee de l'Air Mirage F.1c E.C. 1/12, Norwegian A/F F-5A 'Jokers' 336 Sqn., RAN Sea King HAS.50 817 Sqn.
- 46 IAT 1977(2), RAF: Harrier GR.3 233 OCU, Jaguar GR.1 226 OCU, Belgian A/F Mirage 5BA 8 Sqn. 3rd Wing, L'Armee de l'Air Super Mystere B.2 E.C. 1/12 plus a camouflaged alternative, Luftwaffe F-4F Phantom '37 + 69' or '38 + 57' Jabo 36.
- 49 Royal Navy: Sea King HAS.1 choice between 824 Sqn. 1970, 819 Sqn. 1977, 706 Sqn. 1978. HAS.2 choice between 824 Sqn. 1978, 820 Sqn. 1977, 826 Sqn. 1978 (complete markings for 1 a/c only). USN F-14A Tomcat VF-14 1976, CAF CF-104 Starfighter 429 (Tiger) Sqn. 1977. L'Armee de l'Air F-84G Thunderjet E.C.2/1 1953 or F-84E Thunderjet E.C.1/3 1953.
- 50 RAF: Hawk T.1 234 Sqn. 1978, Jaguar GR.1 31 Sqn. 1977, USAF Thunderjet 77th FBS 1953 or 307th FBS 1952. Australian Navy A-4G Skyhawk 805 Sqn. 1977 as at IAT. L'Armee de l'Air SA330B Puma 1976-77 choice from three machines.
- 51 RAF WW2 (post August 1941) Sky squadron codes letters, in 18, 24, 30 inch heights, and a variety of styles, total of 286 letters.
- 52 RAF 1938-41 Medium Sea Grey squadron code letters in 24, 30 and 36 inch heights.
- 53 RAF 1938-41 Medium Sea Grey squadron code letters in 30 and 48 inch heights. Sets 52 and 53 form a pair which together contain a variety of styles used in this colour, total 342 letters.
- 54 British military a/c red/blue roundels and fin flashing: 1970 to date. Roundel diameters: 8, 12, 18, 25, 27, 30, 36, 48, 54, 84 inches. Fin flash widths: 12, 18, 24, 36 inches. Total content is 82 roundels and 26 inches (app) of fin flashing.
- 55 IAT 1979. RAF: Phantom FGR.2 XV424 in Alcock and Brown commemorative flight scheme. Lightning F.3 Lightning Training Flight, Hawk T.1 63 Sqn. TWU.
- 56 RAF Lightning F.3 56 Sqn. 1965. Royal Navy: W. Lynx HAS.2 702 Sqn. 1978-80, choice from six options. Attacker FB.2 718 Sqn. or 1831 Sqn. 1955. L'Armee de l'Air T-33A 1976.
- 57 Royal Navy Buccaneer S.2 700B Sqn. 1965 or 801 Sqn. 1965 or 800 Sqn. 1971. Sea Hawk FB.3 897 Sqn. 1956 or FGA.6 810 Sqn. 1956. RAF Sea King HAR.3 202 Sqn. 1978-9. L'Armee de l'Air Alpha Jet 314 Gp.Ecole or CEAM. 1978-9.
- 58 British military a/c post-war serial letters (white): 16, 18, 20, 24 inch heights.
- 59 British military a/c post-war serial letters (white): 30, 36, 48 inch heights.
- 60 British military a/c post-war serial numbers (white) to be used with sets 58 and 59.
- 61 British mil/aircraft post-war white serial letters and numerals in current and earlier squarer styles, 48 inches.
- 63 L'Armee de l'Air black Sqn. codes in various styles: 240-530.
- 64 RAF: Phantom FG.1 43 Sqn. 1981 or FGR.2s 56 Sqn. 1981 or 19 Sqn. 1980 or 23 Sqn. 1981, all these options with three-tone grey finish. Phantom FGR.2 92 Sqn. 1977 with grey/green camouflage. Hawk T.1 151 Sqn. 2 TWU 1981. Tornado GR(T)1 TTTE 1981.
- 65 RAF: Phantom FG.1 111 Sqn. 1980 or FGR.2s 92 Sqn. 1981 or 64 Sqn./228 OCU 1981 or 29 Sqn. 1981, all these options with three-tone grey finish. Phantom FGR.2 23 Sqn. 1976 or 19 Sqn. 1977, both with grey/green camouflage. Lightning F.6 5 Sqn. 1981 with two-tone grey finish. R. Navy Sea Harrier, FRS.1 899 Sqn. 1980.
- 67 R. Navy (Falklands) April-Sept 1982: FRS.1 Sea Harriers 809, 899 Sqn. All in medium sea grey schemes, one complete aircraft can be modelled from an eleven aircraft selection. RAF: Tornado GR.1 9 Sqn. or TWCU 1982. Puma HC.1 33 Sqn. 1980 or 230 Sqn. or 240 OCU 1982.
- 68 L'Armee de l'Air: MD450 Ouragan 2/4 E.C. 4 ATAF 1953-55, eight units represented. T-28A Fennec (Trojan) 1960, any one of five units. Alouette 111 F-MJBP Detachment d'Helicopteres de la Gendarmerie 1981.
- 69 L'Armee de l'Air: F-100D/F Super Sabres 3rd and 11th Escadres 1960-78, seven units represented. Mirage F.1B/C 5, 10, 12, 30 Escadres 1976-82. Aeronavale Vought F-8E(FN) Crusader 12th and 14th Flotille 1964-83.

NOTE: To allow the maximum number of squadron options, many of our sets do not include roundels, fin flashing and serial numbering. The two former are intended to come from the relevant kits or MODELDECAL sets 54 and 107 and the latter from sets 33-35, 58-61, 104-106 all as appropriate. 'MODELDECAL' style fully illustrated sheet, giving decal locations, full colour scheme details and a selection of helpful photographs is also included with most sets.

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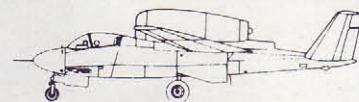
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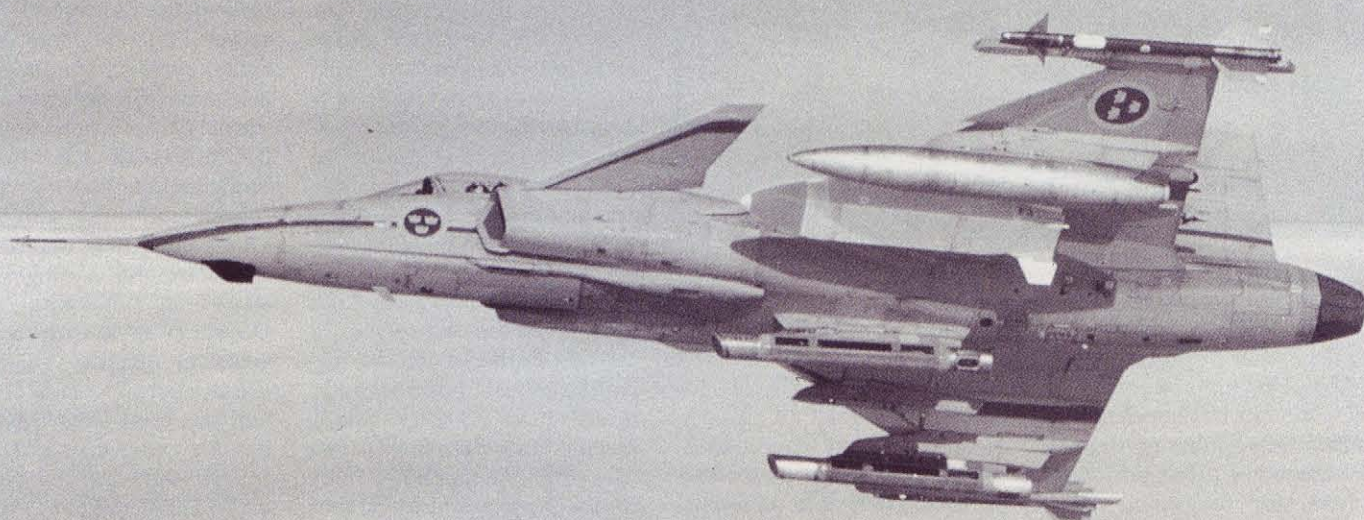
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Saab's JAS39 Gripen

Lindsay Peacock

Although the first example of the Gripen was formally handed over to the Swedish Air Force on 8 June 1993, the very same aircraft (39102) was destroyed following a loss of control during a flying display at Stockholm just two months later, on August 8th. Happily, pilot Lars Radestrom was able to eject from the doomed aircraft in time and survived, but there's no doubt that it was a major setback. Inevitably, time was lost while investigations into the accident were carried out and it was not until 29 December 1993 that testing restarted with the second of five prototypes.

Not surprisingly, the accident was also a key factor in delaying introduction of the Gripen to service with the first operational unit. This will be

F7 Wing at Satenas and the various agencies involved in this ambitious project feel they are now making solid headway in regaining lost time. Indeed, unless any further setbacks arise, they anticipate being back on schedule during the course of 1995.

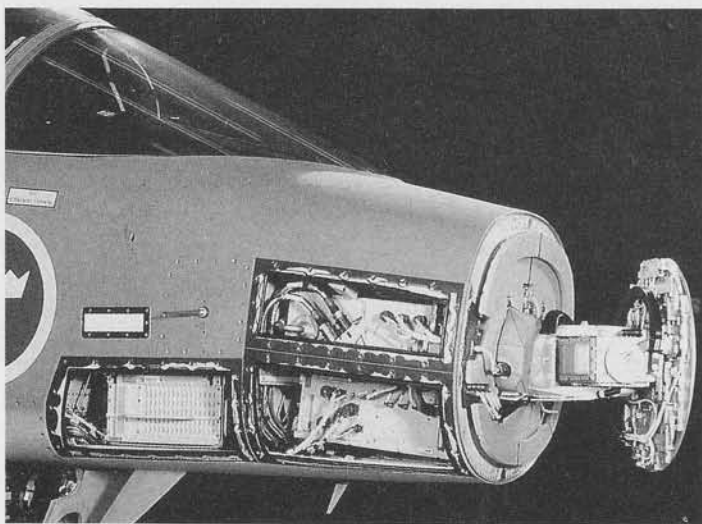
Having revamped software associated with the JAS39's sophisticated Flight Control System, examples of the newest Swedish fighter should become an increasingly common sight in the Satenas approach pattern before too much longer. Currently operating the AJ37 Viggen, F7 has been selected to be the first Gripen unit, although it isn't expected to regain full combat-ready status until some time in 1997, when both squadrons will have completed the process of transitional training.

Despite the delays arising from the loss of the second production example and the need to rectify system shortcomings, the time that has elapsed since the Stockholm accident hasn't been wasted by the main con-

tractors involved in the programme or the customer. Deliveries have continued at a slow rate, although it should be noted that none of the production Gripens accepted by the Swedish Air Force (SwA F)

Top: The Saab JAS.39 Gripen is set to take the Swedish Air Force into the next century – so far 140 production examples have been ordered. Below: The first production Gripen 39101 joined the extensive flight test programme in September 1992 following the loss of the prototype





Above: Something for the super-detailer: the Ericsson PS-05/A pulse doppler radar system fitted to the Gripen.

by the end of August 1994 had flown. That's not to say that these aircraft have been sitting around idly gathering dust in the corner of a hangar somewhere, for they have been pressed into service as teaching aids for SwAF technicians destined to join F7. In fact, one intake of technicians completed on-the-job training at SAAB's Linköping factory in the first half of 1994 and another group was expected to finish the six-month course at about the end of September.

Three production JAS39's (39103-39105) have been allocated to this task and all three display standard F7 unit identification markings. By the end of August 1994, four other production examples of the Gripen (39106-39109) were also either complete or virtually so – both 39106 and 39107 were due for delivery by the end of December. The Gripen is finished in a two-tone grey scheme, which looks as if it will be standard for operational aircraft.

SwAF insignia is carried below the cockpit and in the usual wing locations along with intake warning notices in yellow on what appears to be a pale blue background. Apart from a few small warning notices, the only other distinguishing marks seem to be F7's identification on the nose section in black and the usual two-digit code combination in a vivid day-glo red on the fin. At present the latter corresponds with the final two digits of the serial number, although this may well change once the Gripen is well established in service.

As part of advanced flight tests which are due to start in early 1995, the second test aircraft (39-2) has recently received an all-black colour scheme. In total, the Gripen fleet had completed 1,621 flights by mid-December which represented about 70% of the total number of flight-tests planned.

Procurement

Thus far, firm orders have been placed for a total of 140

production examples in two separate lots. Lot one called for 30 single-seat JAS39s – as already noted, nine of these have already rolled off the assembly line at Linköping and six aircraft are scheduled to be handed over to the SwAF during the course of this year. A visit to the factory in August revealed that 10 more (39110-39119) were undergoing final assembly, with the remainder of the Lot One purchase in various less advanced stages of the production process. Lot Two is considerably larger and covers 110 aircraft, the first few of which are also starting to take shape at Linköping – by December aircraft up to 39139 were in various stages of construction. The bulk of these will also be to JAS39 standard, but this group does include 14 JAS39B two-seaters. A prototype JAS39B (39800) forms the subject of a separate development contract and final assembly of this aircraft actually began at Linköping on 31 August 1994. Roll-out is slated for the latter half of next year, with the maiden flight

Below: Production at Linköping continues apace: seven aircraft are visible in this view of the final assembly hall.



targeted for 1996 and delivery of production examples should follow during 1998.

Aircraft presently on order will be used to equip eight squadrons. F7 is to provide two of those squadrons, but no further details of re-equipment plans have yet been made public, although it seems reasonable to assume that the J35J Drakens of F10 at Angelholm will be early candidates for replacement by Gripen.

Eventually, it is intended to place follow-on contracts with a view to acquiring sufficient Gripens to allow the SwAF to standardise on the type with all 16 front-line combat squadrons. As a consequence, this should result in production for home consumption ultimately surpassing the 300 mark.

New or Revised Engines?

However there is a strong possibility that Lot Three and any subsequent purchases could incorporate a different engine to the RM12 version of General Electric's F404 low bypass ratio turbofan which presently powers the Gripen. This is being considered to satisfy an anticipated demand



for additional power stemming from greater operating weights associated with new equipment and systems. The most likely candidate is a proposed RM12 plus upgraded version of the current turbofan, but attention is also being given to the Snecma M88-3, General Electric F414 and Eurojet EJ200. All of these are the subject of Swedish evaluation and all are

Above: A line-up of Gripens at Linköping in August 1994 – nearest the camera are four production examples whilst fourth prototype, 39-4, taxis past in the background.

evidently compatible with the existing airframe dimensions. Furthermore, any one of them could be installed with only minimal design changes, apart from the air intake system.

All that, of course, lies some way off in the future and the

primary concerns now are to ensure that the remaining development objectives are carried through as smoothly and efficiently as possible and that F7's imminent transition from Viggen to Gripen is accomplished in similar fashion.

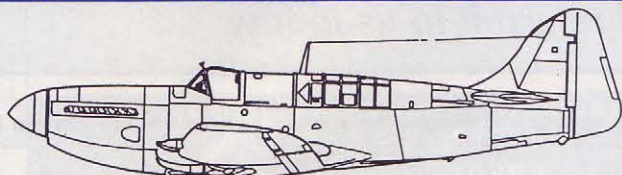
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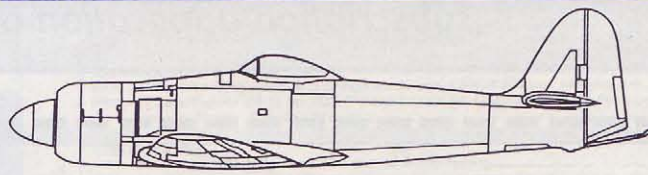
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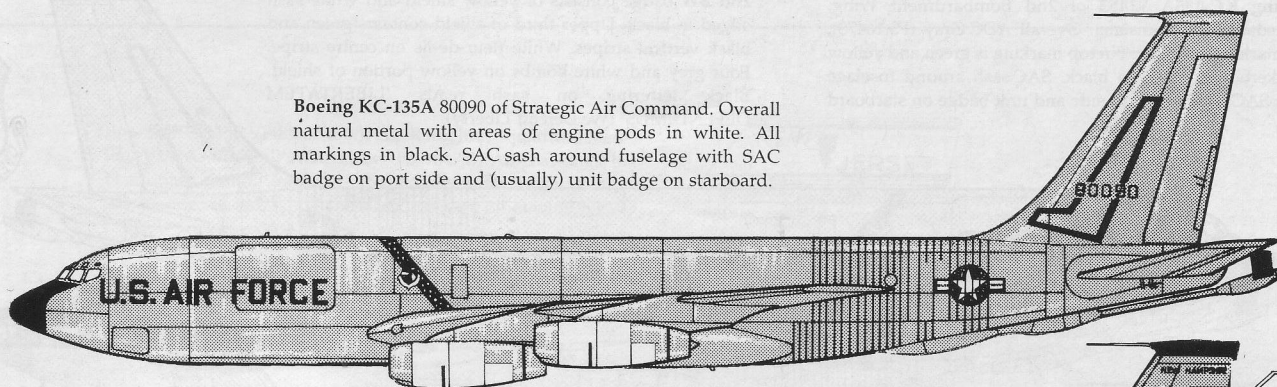
£2.50

FTAS004 Gulf Tornado :- new nose, JP233s, Hindenburger fuel tanks, BOZ107 and Sky Shadow pod

£8.50

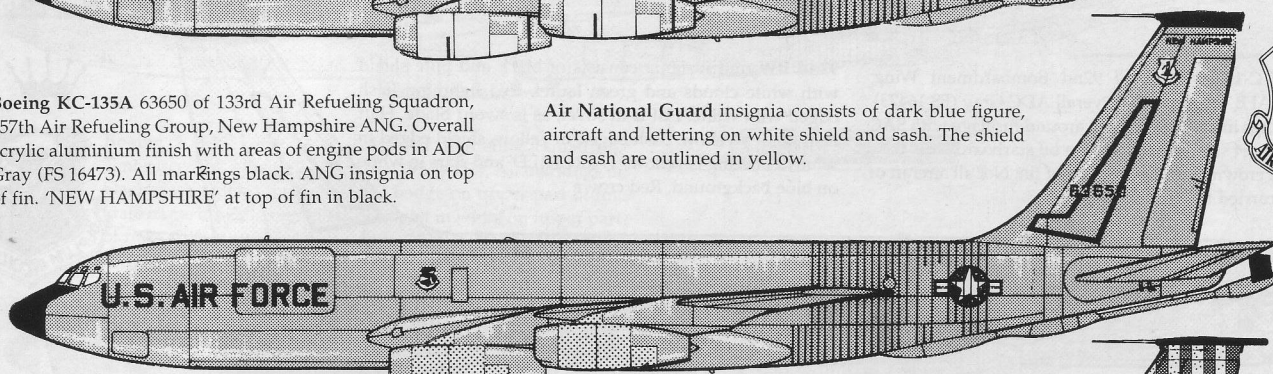
FTAS005 1:48 Tornado set one:- Correct shaped fin for the Italeri kit and two Hindenburger fuel tanks

Boeing KC-135A 80090 of Strategic Air Command. Overall natural metal with areas of engine pods in white. All markings in black. SAC sash around fuselage with SAC badge on port side and (usually) unit badge on starboard.



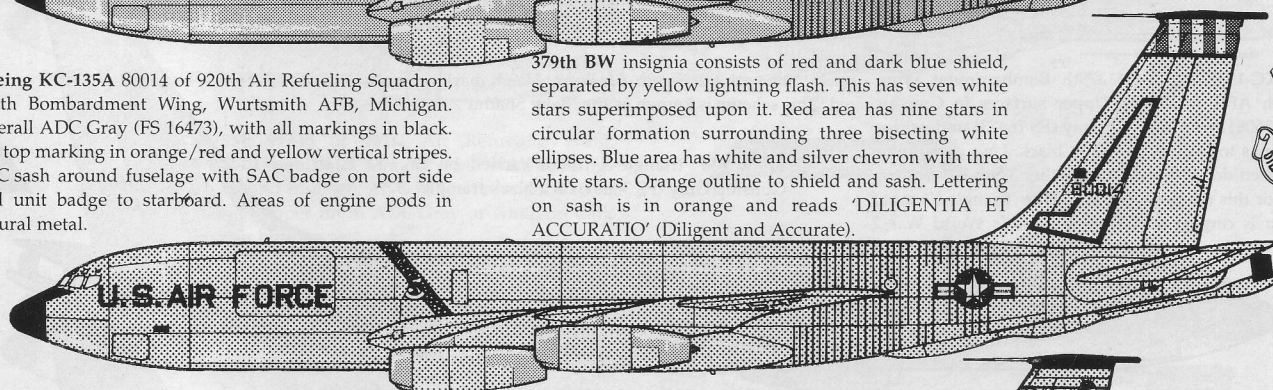
Boeing KC-135A 63650 of 133rd Air Refueling Squadron, 157th Air Refueling Group, New Hampshire ANG. Overall acrylic aluminium finish with areas of engine pods in ADC Gray (FS 16473). All markings black. ANG insignia on top of fin. 'NEW HAMPSHIRE' at top of fin in black.

Air National Guard insignia consists of dark blue figure, aircraft and lettering on white shield and sash. The shield and sash are outlined in yellow.



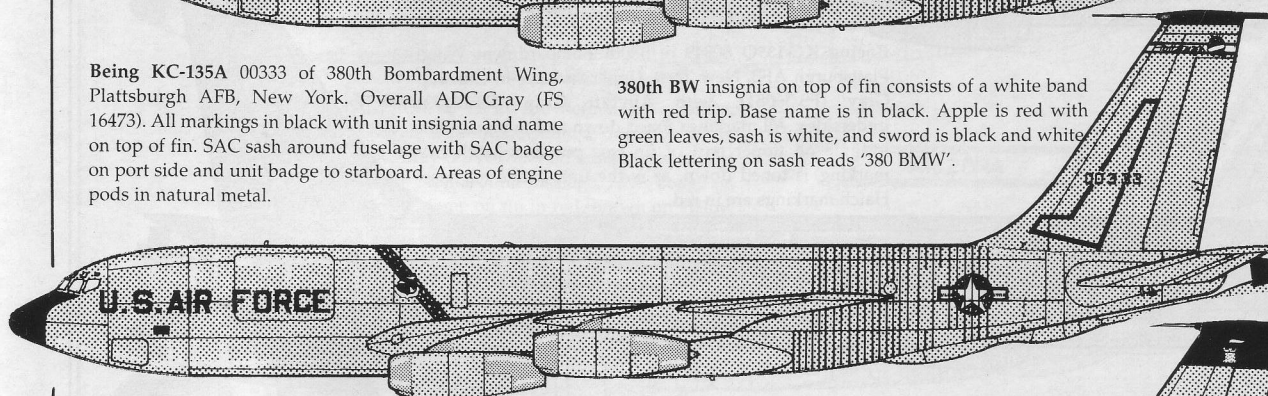
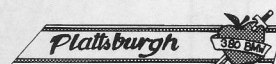
Boeing KC-135A 80014 of 920th Air Refueling Squadron, 379th Bombardment Wing, Wurtsmith AFB, Michigan. Overall ADC Gray (FS 16473), with all markings in black. Fin top marking in orange/red and yellow vertical stripes. SAC sash around fuselage with SAC badge on port side and unit badge to starboard. Areas of engine pods in natural metal.

379th BW insignia consists of red and dark blue shield, separated by yellow lightning flash. This has seven white stars superimposed upon it. Red area has nine stars in circular formation surrounding three bisecting white ellipses. Blue area has white and silver chevron with three white stars. Orange outline to shield and sash. Lettering on sash is in orange and reads 'DILIGENTIA ET ACCURATIO' (Diligent and Accurate).



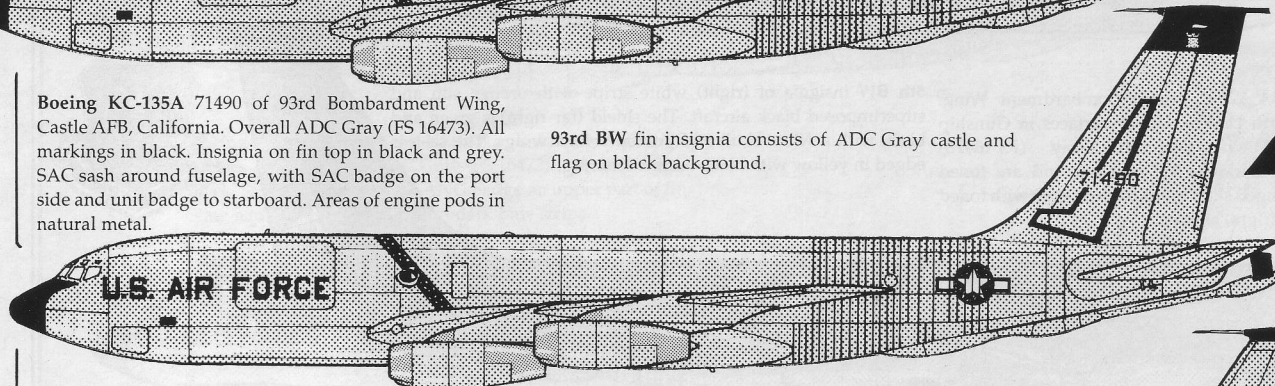
Boeing KC-135A 00333 of 380th Bombardment Wing, Plattsburgh AFB, New York. Overall ADC Gray (FS 16473). All markings in black with unit insignia and name on top of fin. SAC sash around fuselage with SAC badge on port side and unit badge to starboard. Areas of engine pods in natural metal.

380th BW insignia on top of fin consists of a white band with red trip. Base name is in black. Apple is red with green leaves, sash is white, and sword is black and white. Black lettering on sash reads '380 BMW'.



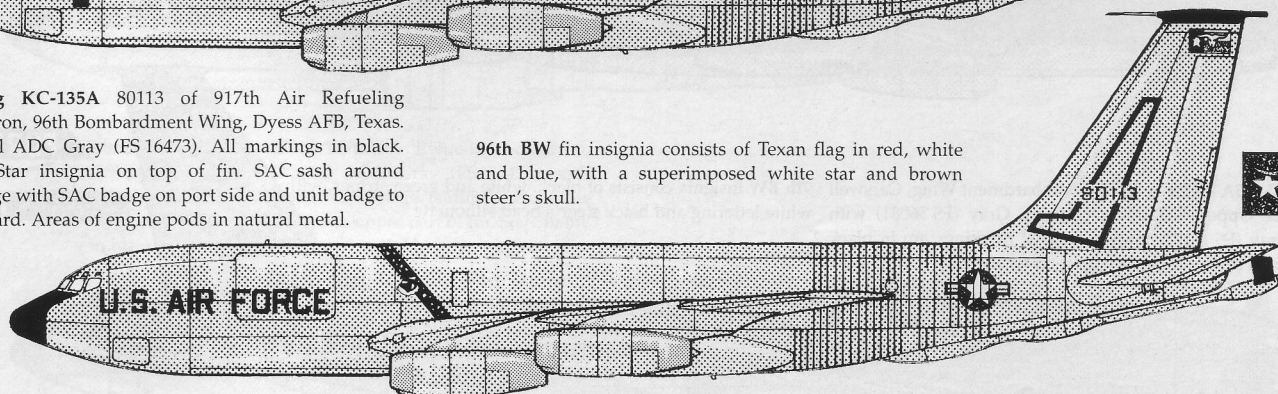
Boeing KC-135A 71490 of 93rd Bombardment Wing, Castle AFB, California. Overall ADC Gray (FS 16473). All markings in black. Insignia on fin top in black and grey. SAC sash around fuselage, with SAC badge on the port side and unit badge to starboard. Areas of engine pods in natural metal.

93rd BW fin insignia consists of ADC Gray castle and flag on black background.



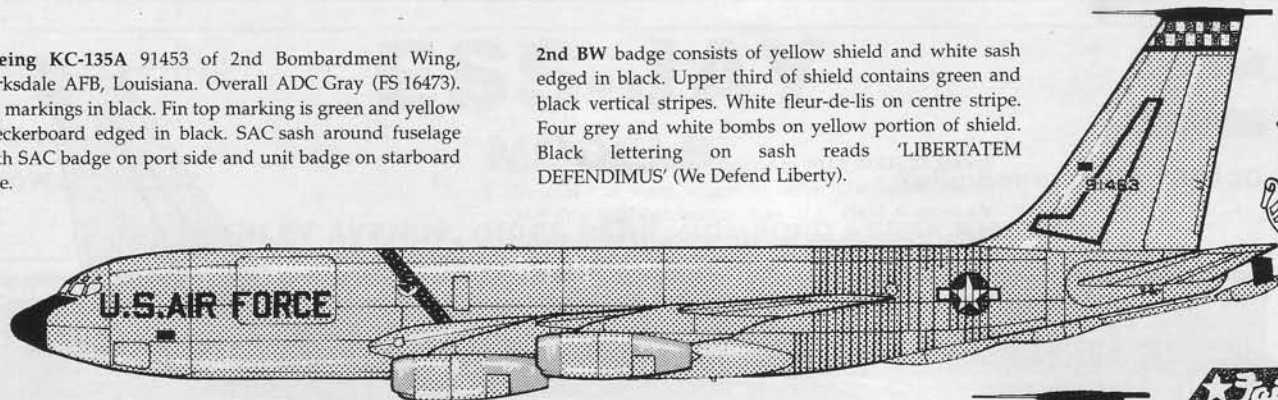
Boeing KC-135A 80113 of 917th Air Refueling Squadron, 96th Bombardment Wing, Dyess AFB, Texas. Overall ADC Gray (FS 16473). All markings in black. Lone Star insignia on top of fin. SAC sash around fuselage with SAC badge on port side and unit badge to starboard. Areas of engine pods in natural metal.

96th BW fin insignia consists of Texan flag in red, white and blue, with a superimposed white star and brown steer's skull.



Boeing KC-135A 91453 of 2nd Bombardment Wing, Barksdale AFB, Louisiana. Overall ADC Gray (FS 16473). All markings in black. Fin top marking is green and yellow checkerboard edged in black. SAC sash around fuselage with SAC badge on port side and unit badge on starboard side.

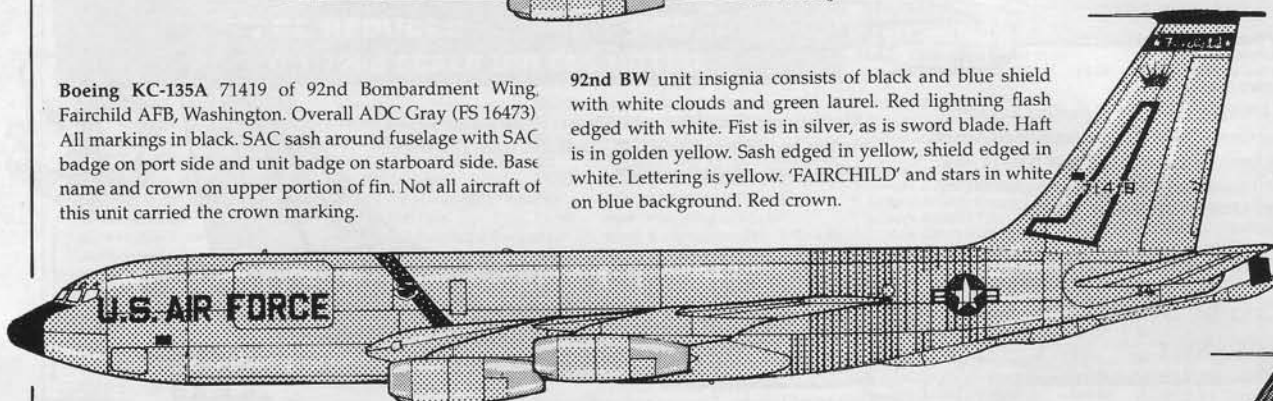
2nd BW badge consists of yellow shield and white sash edged in black. Upper third of shield contains green and black vertical stripes. White fleur-de-lis on centre stripe. Four grey and white bombs on yellow portion of shield. Black lettering on sash reads 'LIBERTATEM DEFENDIMUS' (We Defend Liberty).



Boeing KC-135A 71419 of 92nd Bombardment Wing, Fairchild AFB, Washington. Overall ADC Gray (FS 16473). All markings in black. SAC sash around fuselage with SAC badge on port side and unit badge on starboard side. Base name and crown on upper portion of fin. Not all aircraft of this unit carried the crown marking.

92nd BW unit insignia consists of black and blue shield with white clouds and green laurel. Red lightning flash edged with white. Fist is in silver, as is sword blade. Haft is in golden yellow. Sash edged in yellow, shield edged in white. Lettering is yellow. 'FAIRCHILD' and stars in white on blue background. Red crown.

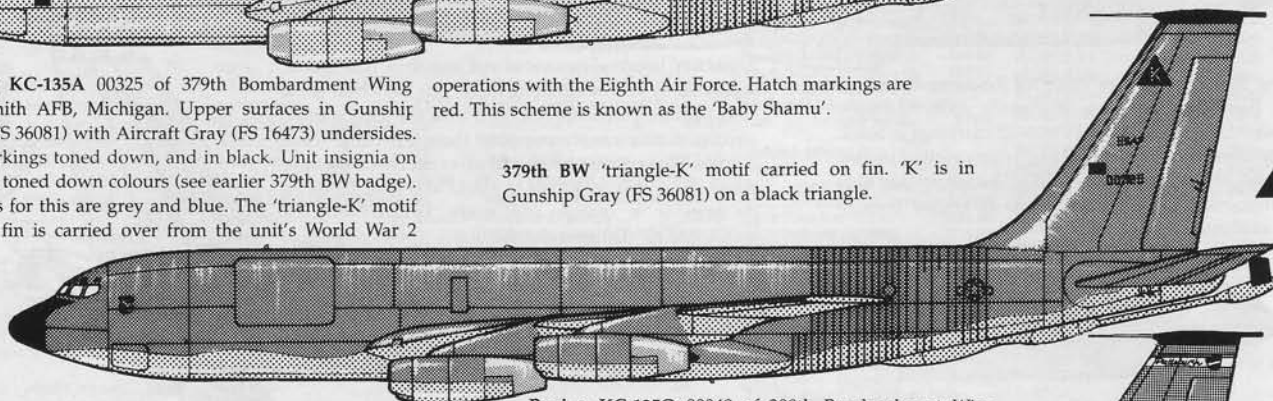
★Fairchild★



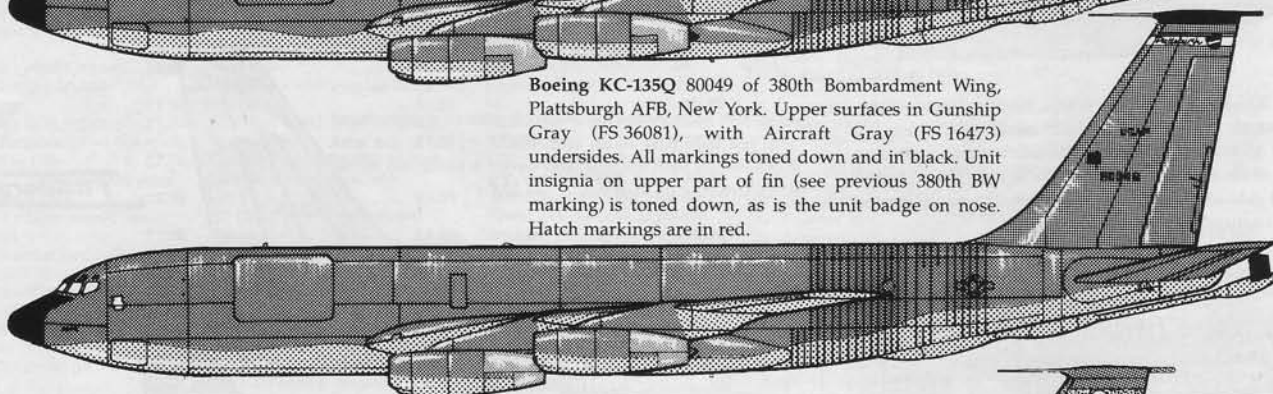
Boeing KC-135A 00325 of 379th Bombardment Wing, Wurtsmith AFB, Michigan. Upper surfaces in Gunship Gray (FS 36081) with Aircraft Gray (FS 16473) undersides. All markings toned down, and in black. Unit insignia on nose in toned down colours (see earlier 379th BW badge). Colours for this are grey and blue. The 'triangle-K' motif on the fin is carried over from the unit's World War 2

operations with the Eighth Air Force. Hatch markings are red. This scheme is known as the 'Baby Shamu'.

379th BW 'triangle-K' motif carried on fin. 'K' is in Gunship Gray (FS 36081) on a black triangle.

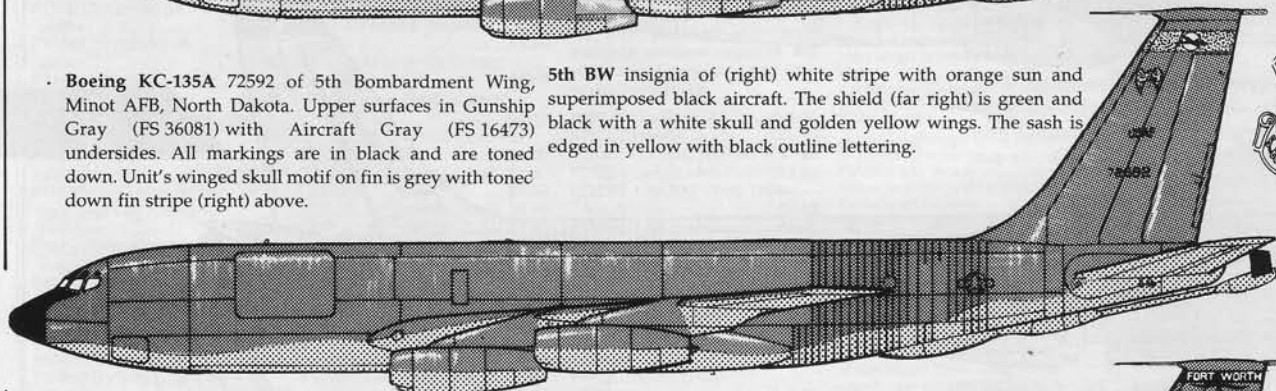


Boeing KC-135Q 80049 of 380th Bombardment Wing, Plattsburgh AFB, New York. Upper surfaces in Gunship Gray (FS 36081), with Aircraft Gray (FS 16473) undersides. All markings toned down and in black. Unit insignia on upper part of fin (see previous 380th BW marking) is toned down, as is the unit badge on nose. Hatch markings are in red.



Boeing KC-135A 72592 of 5th Bombardment Wing, Minot AFB, North Dakota. Upper surfaces in Gunship Gray (FS 36081) with Aircraft Gray (FS 16473) undersides. All markings are in black and are toned down. Unit's winged skull motif on fin is grey with toned down fin stripe (right) above.

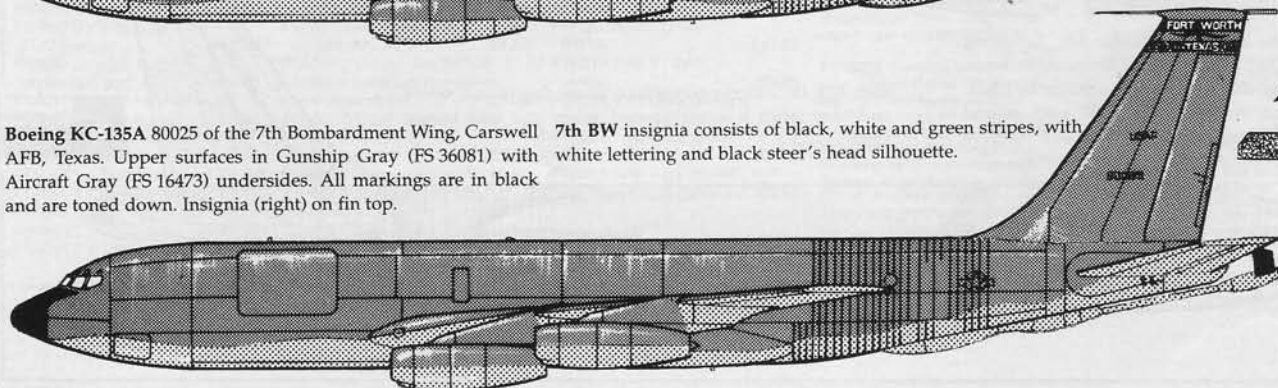
5th BW insignia of (right) white stripe with orange sun and superimposed black aircraft. The shield (far right) is green and black with a white skull and golden yellow wings. The sash is edged in yellow with black outline lettering.



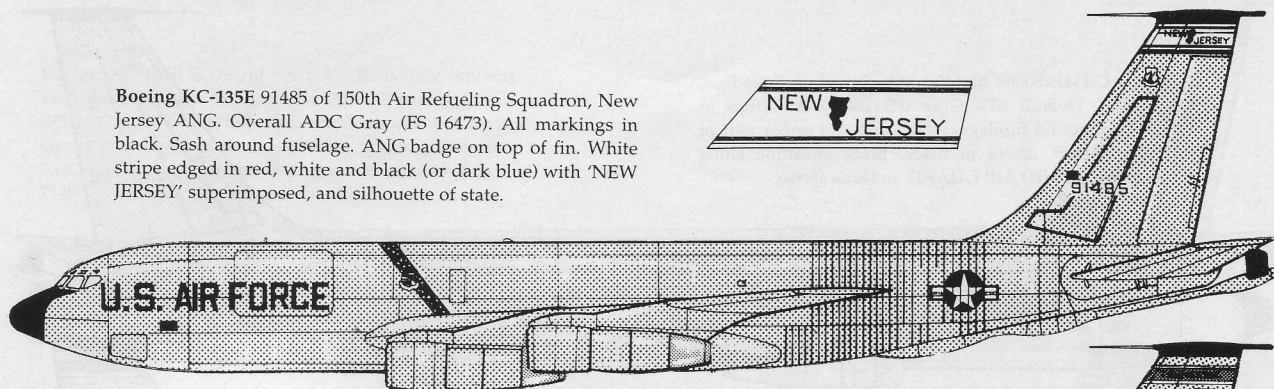
Boeing KC-135A 80025 of the 7th Bombardment Wing, Carswell AFB, Texas. Upper surfaces in Gunship Gray (FS 36081) with Aircraft Gray (FS 16473) undersides. All markings are in black and are toned down. Insignia (right) on fin top.

7th BW insignia consists of black, white and green stripes, with white lettering and black steer's head silhouette.

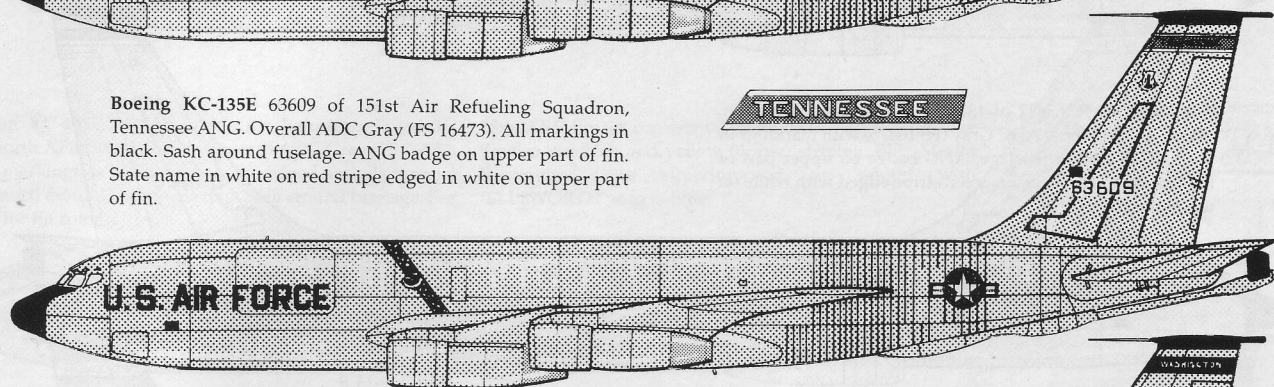
FORT WORTH
TEXAS



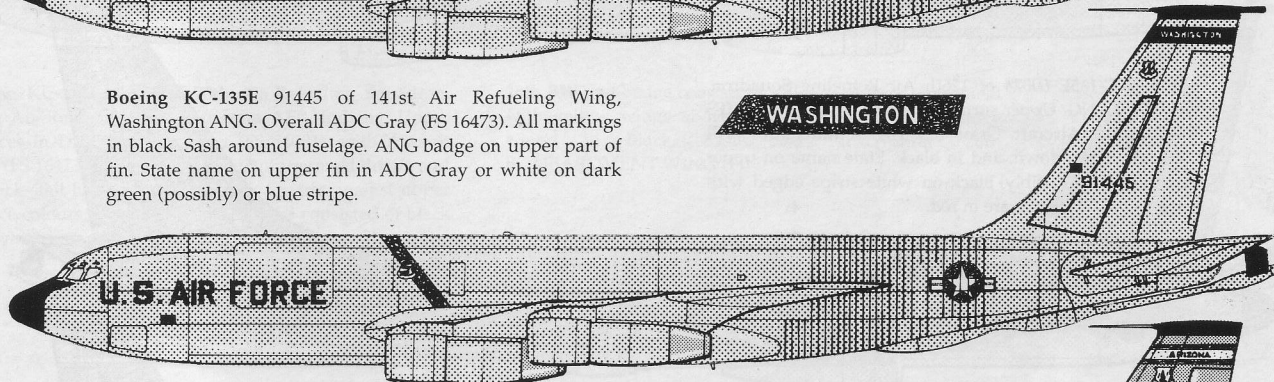
Boeing KC-135E 91485 of 150th Air Refueling Squadron, New Jersey ANG. Overall ADC Gray (FS 16473). All markings in black. Sash around fuselage. ANG badge on top of fin. White stripe edged in red, white and black (or dark blue) with 'NEW JERSEY' superimposed, and silhouette of state.



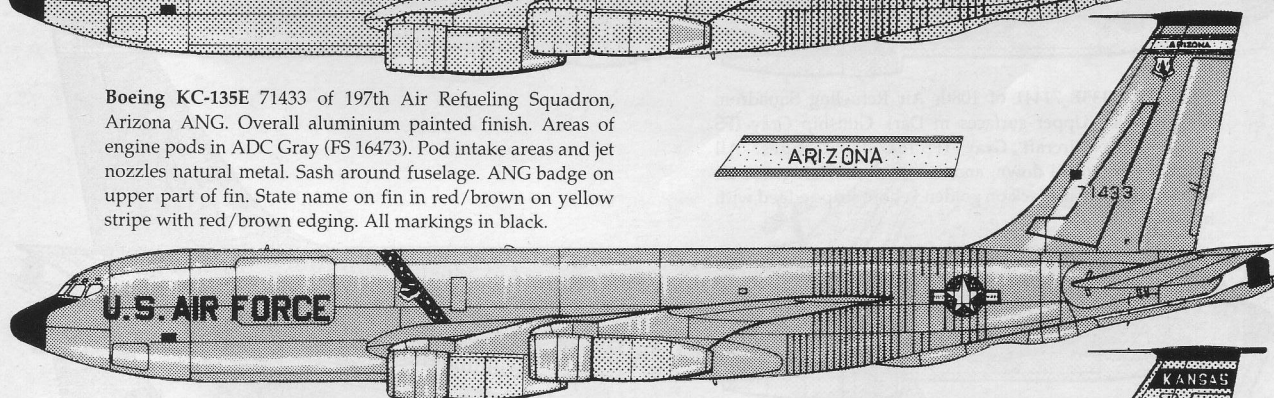
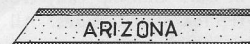
Boeing KC-135E 63609 of 151st Air Refueling Squadron, Tennessee ANG. Overall ADC Gray (FS 16473). All markings in black. Sash around fuselage. ANG badge on upper part of fin. State name in white on red stripe edged in white on upper part of fin.



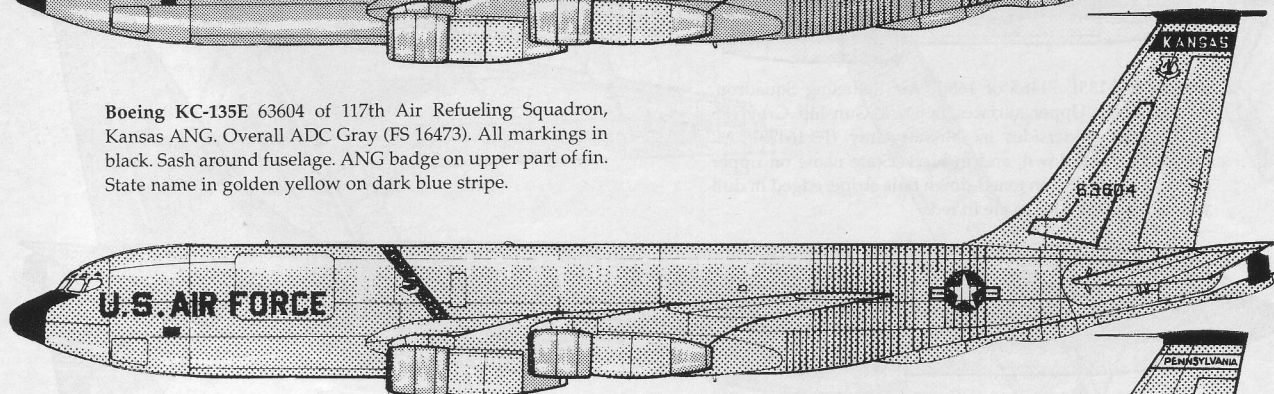
Boeing KC-135E 91445 of 141st Air Refueling Wing, Washington ANG. Overall ADC Gray (FS 16473). All markings in black. Sash around fuselage. ANG badge on upper part of fin. State name on upper fin in ADC Gray or white on dark green (possibly) or blue stripe.



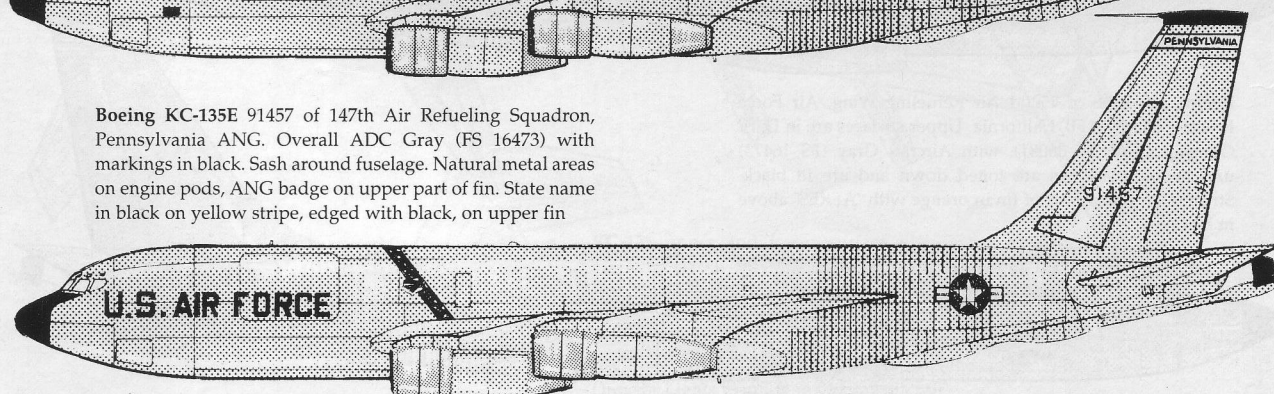
Boeing KC-135E 71433 of 197th Air Refueling Squadron, Arizona ANG. Overall aluminium painted finish. Areas of engine pods in ADC Gray (FS 16473). Pod intake areas and jet nozzles natural metal. Sash around fuselage. ANG badge on upper part of fin. State name on fin in red/brown on yellow stripe with red/brown edging. All markings in black.



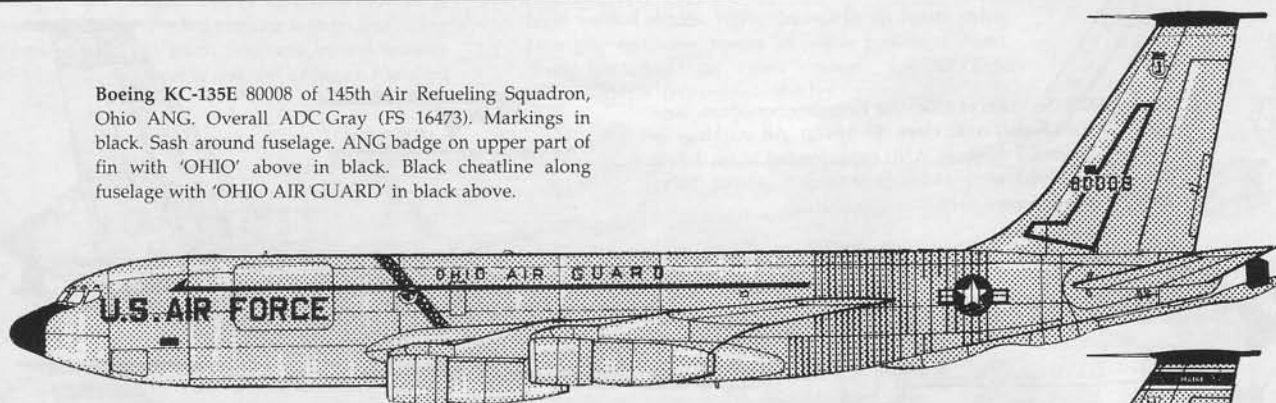
Boeing KC-135E 63604 of 117th Air Refueling Squadron, Kansas ANG. Overall ADC Gray (FS 16473). All markings in black. Sash around fuselage. ANG badge on upper part of fin. State name in golden yellow on dark blue stripe.



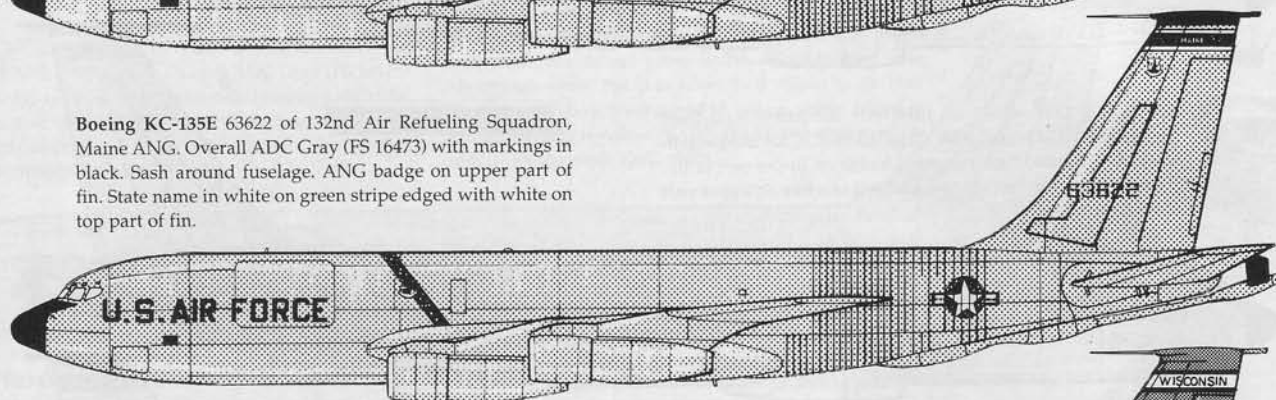
Boeing KC-135E 91457 of 147th Air Refueling Squadron, Pennsylvania ANG. Overall ADC Gray (FS 16473) with markings in black. Sash around fuselage. Natural metal areas on engine pods, ANG badge on upper part of fin. State name in black on yellow stripe, edged with black, on upper fin.



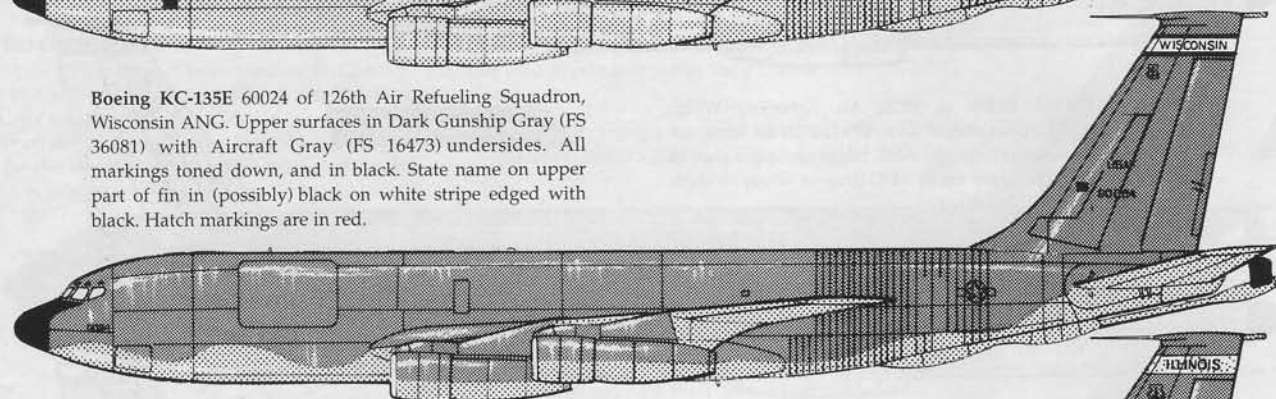
Boeing KC-135E 80008 of 145th Air Refueling Squadron, Ohio ANG. Overall ADC Gray (FS 16473). Markings in black. Sash around fuselage. ANG badge on upper part of fin with 'OHIO' above in black. Black cheatline along fuselage with 'OHIO AIR GUARD' in black above.



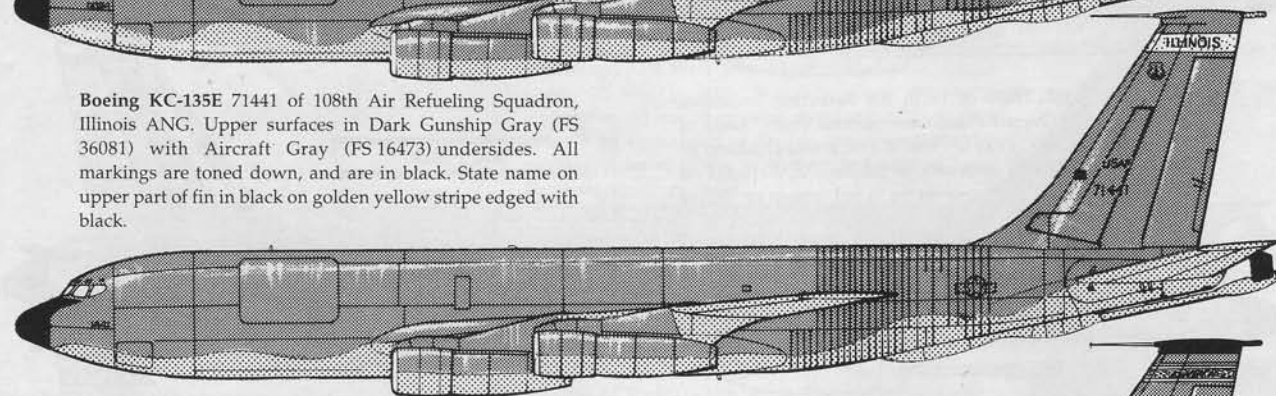
Boeing KC-135E 63622 of 132nd Air Refueling Squadron, Maine ANG. Overall ADC Gray (FS 16473) with markings in black. Sash around fuselage. ANG badge on upper part of fin. State name in white on green stripe edged with white on top part of fin.



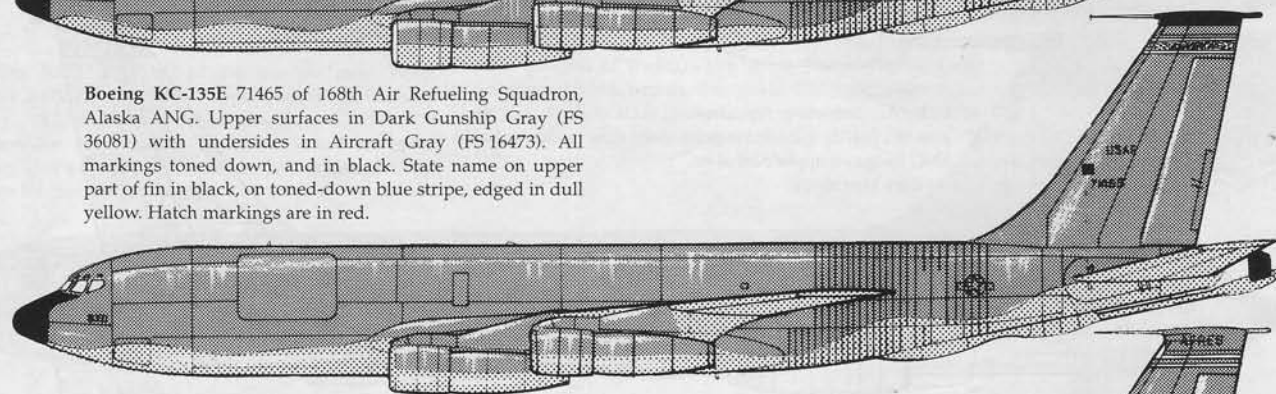
Boeing KC-135E 60024 of 126th Air Refueling Squadron, Wisconsin ANG. Upper surfaces in Dark Gunship Gray (FS 36081) with Aircraft Gray (FS 16473) undersides. All markings toned down, and in black. State name on upper part of fin in (possibly) black on white stripe edged with black. Hatch markings are in red.



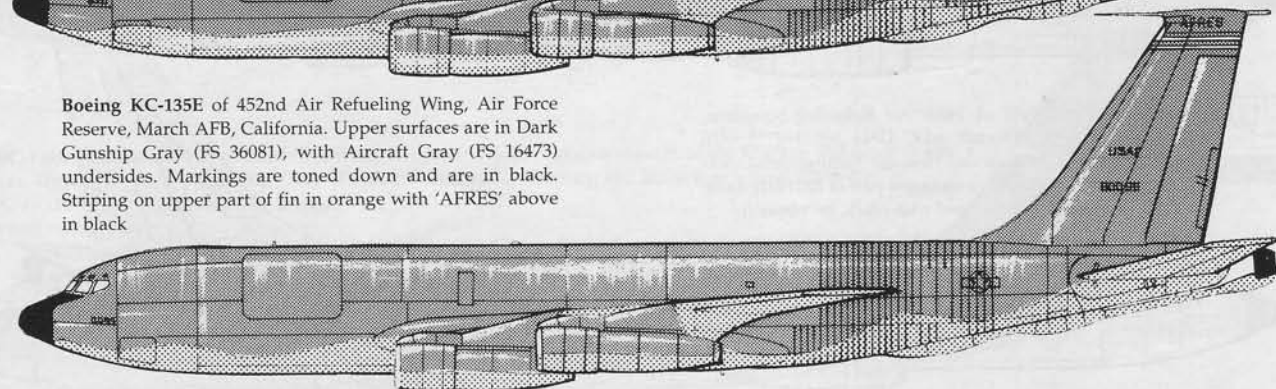
Boeing KC-135E 71441 of 108th Air Refueling Squadron, Illinois ANG. Upper surfaces in Dark Gunship Gray (FS 36081) with Aircraft Gray (FS 16473) undersides. All markings are toned down, and are in black. State name on upper part of fin in black on golden yellow stripe edged with black.



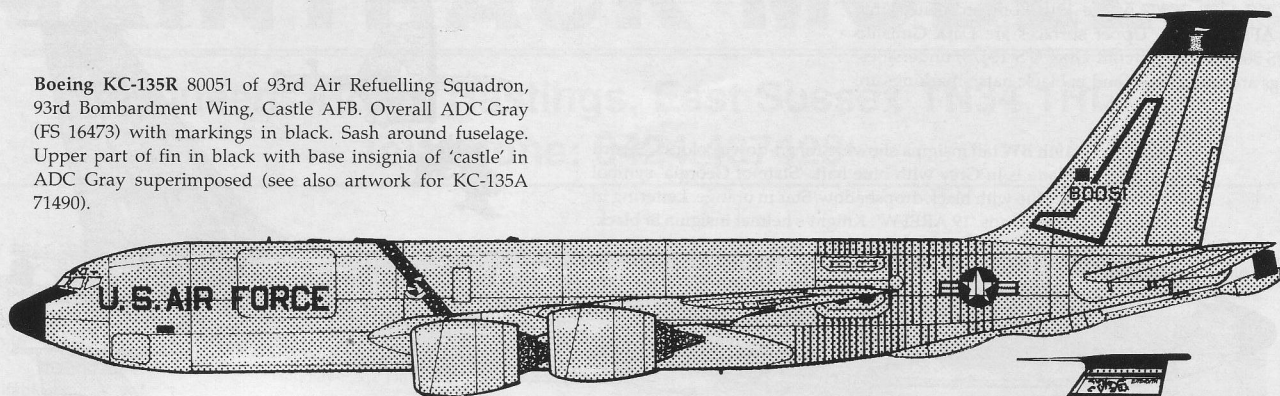
Boeing KC-135E 71465 of 168th Air Refueling Squadron, Alaska ANG. Upper surfaces in Dark Gunship Gray (FS 36081) with undersides in Aircraft Gray (FS 16473). All markings toned down, and in black. State name on upper part of fin in black, on toned-down blue stripe, edged in dull yellow. Hatch markings are in red.



Boeing KC-135E of 452nd Air Refueling Wing, Air Force Reserve, March AFB, California. Upper surfaces are in Dark Gunship Gray (FS 36081), with Aircraft Gray (FS 16473) undersides. Markings are toned down and are in black. Striping on upper part of fin in orange with 'AFRES' above in black.

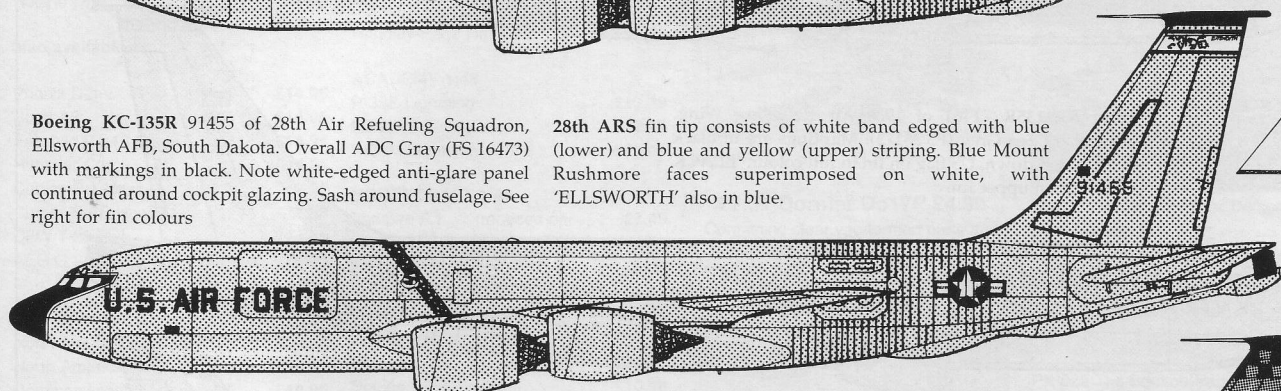


Boeing KC-135R 80051 of 93rd Air Refuelling Squadron, 93rd Bombardment Wing, Castle AFB. Overall ADC Gray (FS 16473) with markings in black. Sash around fuselage. Upper part of fin in black with base insignia of 'castle' in ADC Gray superimposed (see also artwork for KC-135A 71490).



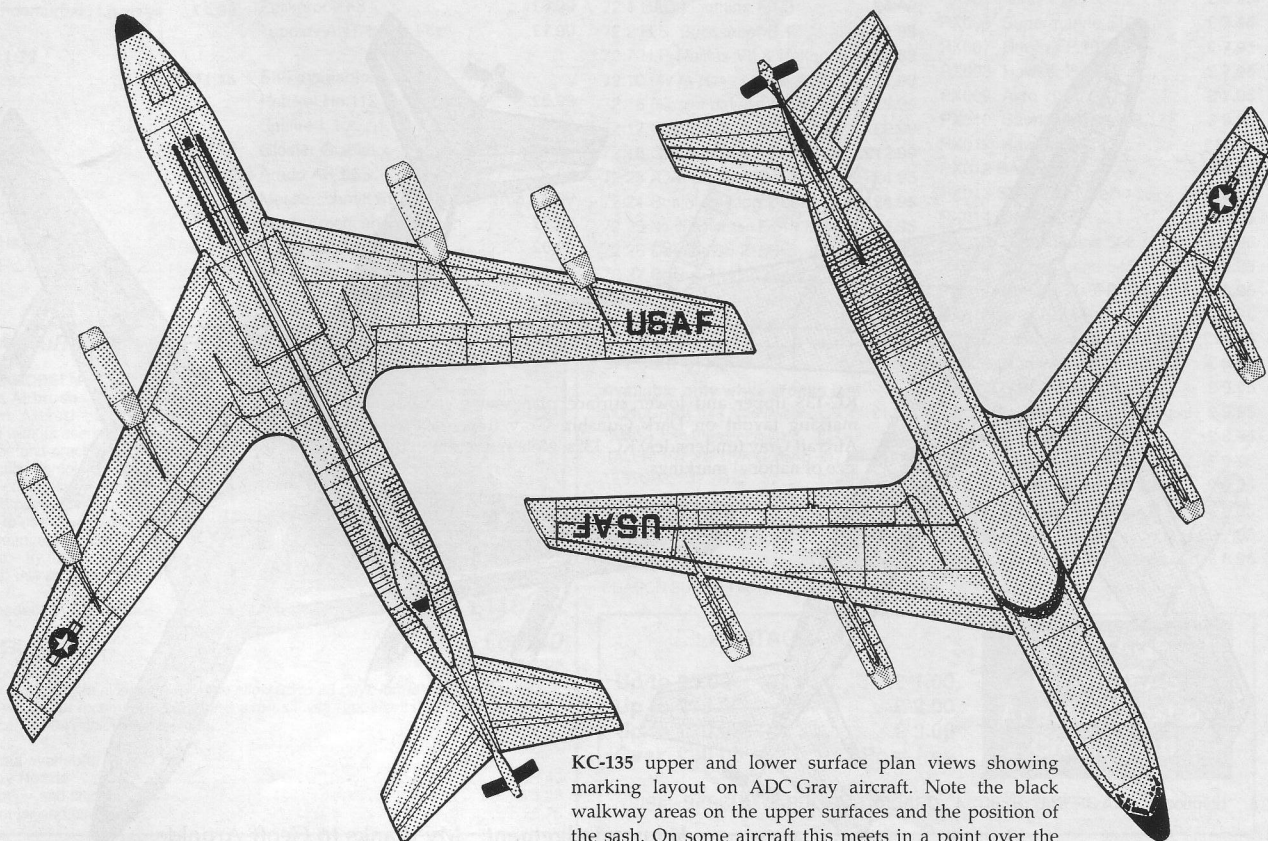
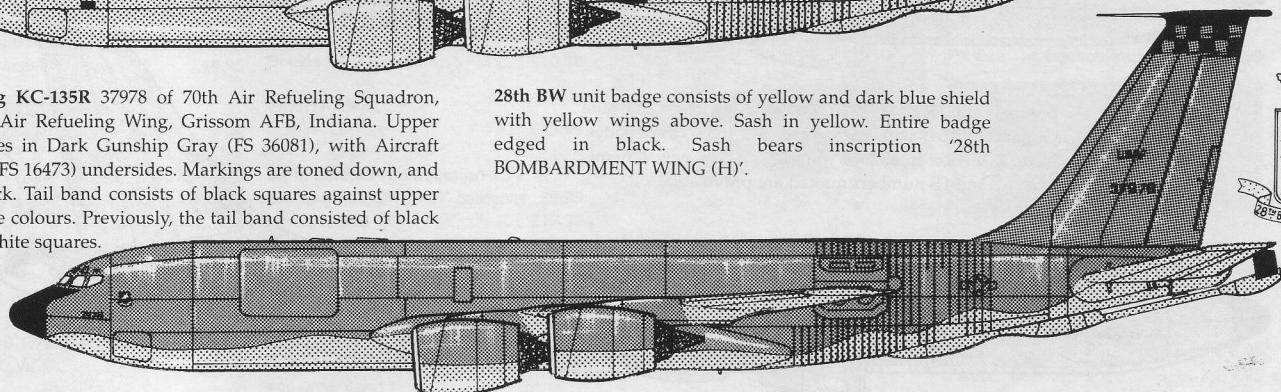
Boeing KC-135R 91455 of 28th Air Refueling Squadron, Ellsworth AFB, South Dakota. Overall ADC Gray (FS 16473) with markings in black. Note white-edged anti-glare panel continued around cockpit glazing. Sash around fuselage. See right for fin colours

28th ARS fin tip consists of white band edged with blue (lower) and blue and yellow (upper) striping. Blue Mount Rushmore faces superimposed on white, with 'ELLSWORTH' also in blue.



Boeing KC-135R 37978 of 70th Air Refueling Squadron, 305th Air Refueling Wing, Grissom AFB, Indiana. Upper surfaces in Dark Gunship Gray (FS 36081), with Aircraft Gray (FS 16473) undersides. Markings are toned down, and in black. Tail band consists of black squares against upper surface colours. Previously, the tail band consisted of black and white squares.

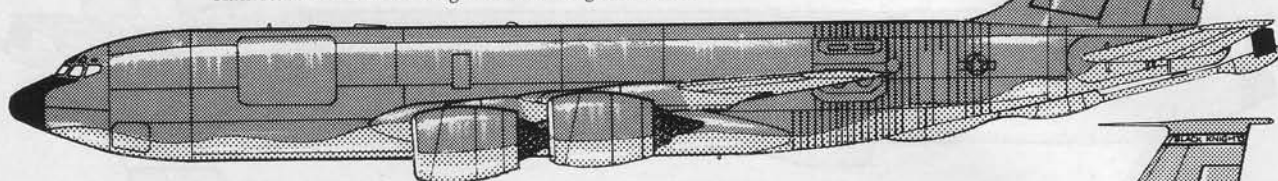
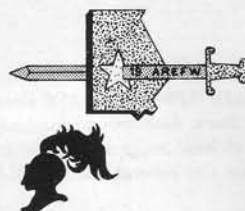
28th BW unit badge consists of yellow and dark blue shield with yellow wings above. Sash in yellow. Entire badge edged in black. Sash bears inscription '28th BOMBARDMENT WING (H)'.



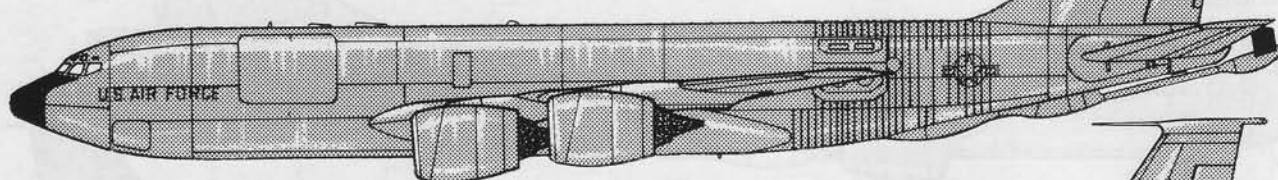
KC-135 upper and lower surface plan views showing marking layout on ADC Gray aircraft. Note the black walkway areas on the upper surfaces and the position of the sash. On some aircraft this meets in a point over the fuselage. This plan shows the alternative curved style. On the lower surfaces under the forward fuselage are the Pilot Director Lights to guide in-coming aircraft.

Boeing KC-135R 10307 of the 19th Bombardment Wing, Robins AFB, Georgia. Upper surfaces are Dark Gunship Gray (FS 36081) with Aircraft Gray (FS 16473) undersides. Markings are toned down and in black; hatch markings are red.

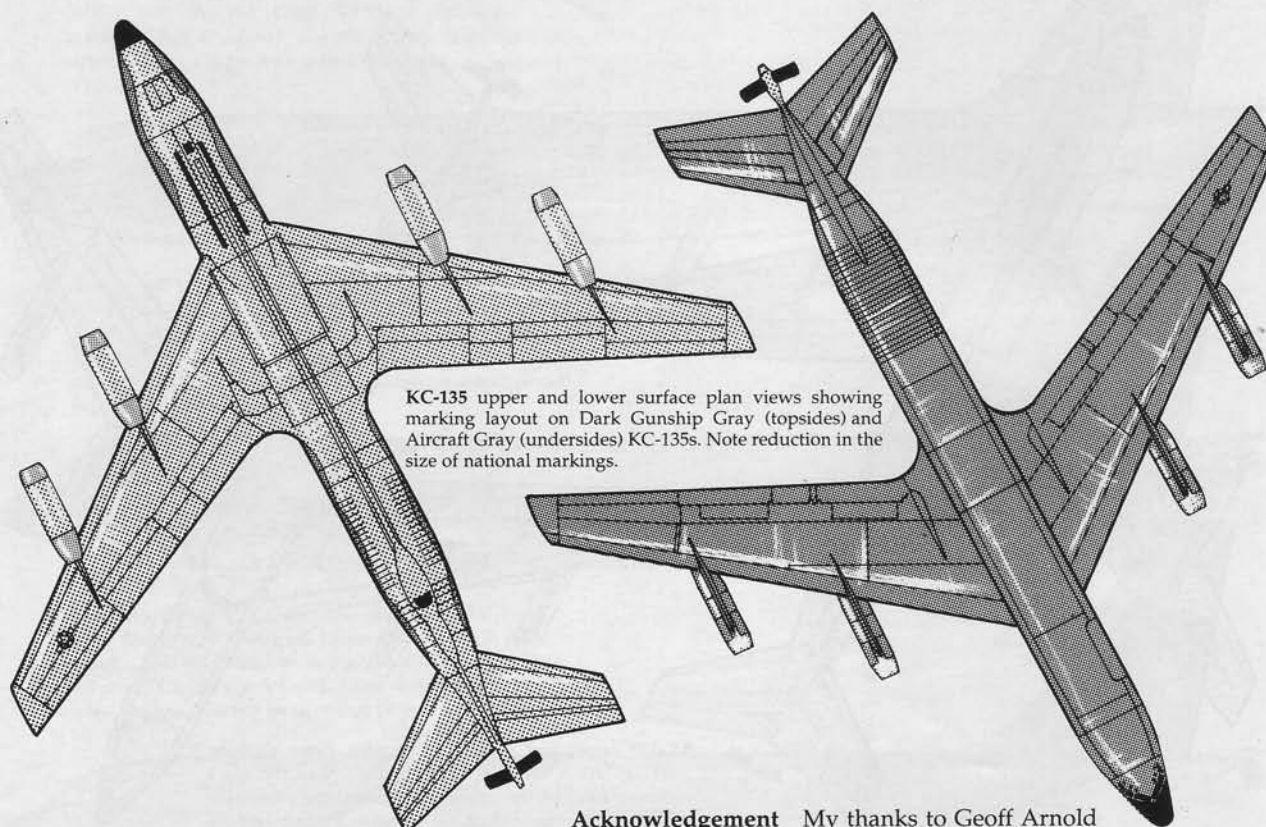
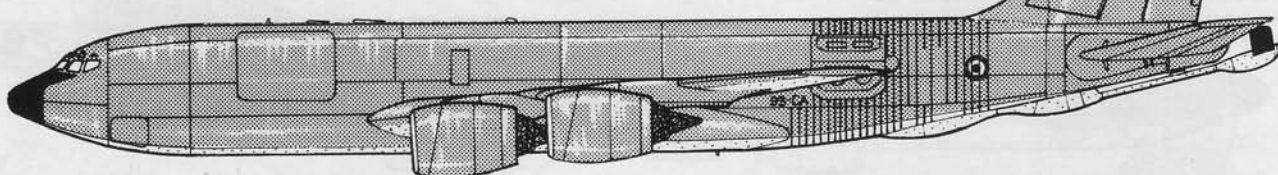
19th BW tail insignia showing toned-down colours. Sword blade is in Grey with blue haft. 'State of Georgia' symbol in blue with black dropshadow. Star in orange. Lettering in black reads '19 AREFW'. Knight's helmet insignia in black.



Boeing KC-135R 71461 of 19th Air Refueling Wing. Overall Dark Sea Grey (FS 36173). Markings are in black and are toned down. US flag on fin in full colour. 'BLACK KNIGHTS' on upper fin.



Boeing C-135FR 470/93-CA. Overall (possibly) Dark Blue Gray (FS 15164) with Light Gray (FS 16357) undersides. Note reduction in size of roundels in this new scheme. Colours and FS numbers quoted are provisional.



KC-135 upper and lower surface plan views showing marking layout on Dark Gunship Gray (topsides) and Aircraft Gray (undersides) KC-135s. Note reduction in the size of national markings.

Acknowledgement My thanks to Geoff Arnold and Ian Huntley for their help in producing these drawings.

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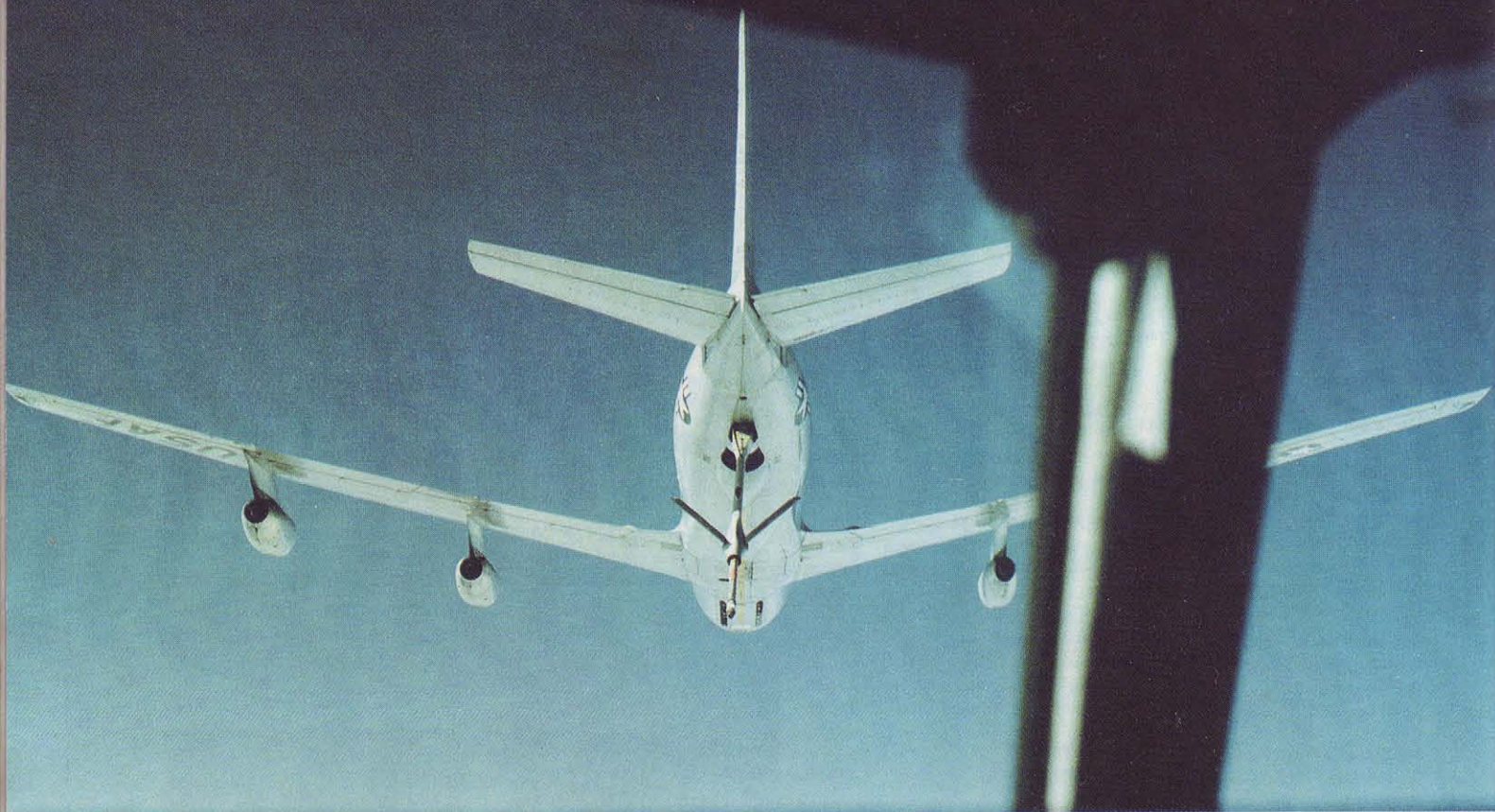
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KC-135 STRATOTANKER

Lindsay Peacock chronicles the history of Boeing's versatile tanker

Now approaching the end of its fourth decade of operational service, Boeing's KC-135 Stratotanker is one of those aircraft that seems to have been around for an eternity and it is abundantly clear that it must represent one of the soundest investments yet made by any element of the US armed forces. Over the years, it has also proved to be one of the most versatile, since variations on the basic tanker theme have satisfactorily undertaken a host of different tasks and missions such as electronic reconnaissance, photo-mapping, communications relay, airborne command post and conventional airlift. Even more remarkably, that career shows little or no sign of drawing to a close – and the Stratotanker may yet go on to be one of the most durable investments ever, since there appears every prospect that it will remain in the USAF inventory for at least another 25 years and, quite possibly, rather longer than that.

In view of that versatility and a desire to do full justice to Boeing's creation, fans of the 'One-Three-Five' might wish to take note that the many special mission adaptations will be examined in a separate feature at some future date. For now, though, it is intended to concentrate on the half-a-dozen tanker variations that have been utilised in an operational capacity by elements of the USAF, as well as the further two derivatives used by France's Armée de l'Air.

For the record, pure tanker models that have seen service with the USAF comprise the KC-135A, KC-135D, KC-135E, KC-135Q, KC-135R and KC-135T. As for France, the principal derivatives consist of the C-135F and C-135FR, which are fundamentally equivalent to the KC-135A and KC-135R respectively. However, it is worth mentioning that the Armée de l'Air is now also operating a small number of KC-135Rs on loan from the USAF.

Those who are unfamiliar with the US designation system may also point to the KC-135B as being a specialist tanker version. At first glance, this would appear to be the case, but this turbofan-powered model was only ever employed by the USAF in the airborne command post role and was subsequently redesignated as either an EC-135C or

EC-135J, depending upon the nature of the electronic equipment installed.

As far as evolution is concerned, the roots of the KC-135 may fairly be said to lie in an ambitious private venture undertaken by Boeing in the early 1950s. Building on the expertise and experience gained during the process of developing and manufactur-

Top: A fighter's-eye view of the KC-135. (Author). Below: One of the KC-135A's failings was the immense quantity of thick black smoke churned out by its Pratt & Whitney J57 engines, as demonstrated by 56-3654 of the 132nd ARS, Maine Air National Guard – the Maineacs. (Author)





Left: KC-135A 59-1500 of the 42nd Bombardment Wing based at Loring AFB, Maine carries a distinctive moose-head motif beneath the base name. (Author)

ing the B-47 Stratojet and B-52 Stratofortress bombers, this resulted in the advent of a new four-engined jet known as the Model 367-80.

A single prototype was funded and built by Boeing and this machine made its maiden flight on 15 July 1954. Although Boeing must have had high hopes for its latest creation, the 367-80 (often more familiarly known as the 'Dash Eighty') was launched without benefit of any civil or military contracts whatsoever but that single aircraft was to provide a cornerstone of the company's fantastic success in the latter half of the 1950s and on into the next decade.

In time, further development spawned two successors, specifically the commercial Boeing 707 and the military Boeing 717, or KC-135 Stratotanker as it became much more widely known. At the time of the 367-80's first flight, Boeing had already succeeded in cornering the tanker market with the piston-powered KC-97 Stratofreighter and the manufacturer was heavily

committed to producing over 800 such aircraft for service with Strategic Air Command (SAC).

However, when compared with the aircraft it refuelled, it was obvious that the portly 'Strat' was far from being the ideal solution, since its low speed and poor altitude capability inevitably meant that jet-powered receivers like the B-47 and B-52 had to decelerate and descend in order to replenish their fuel tanks. This was clearly undesirable and it didn't take too much brainpower to consider the idea of marrying the proven 'flying boom' refuelling equipment of the KC-97 to the prototype 367-80 to produce a jet-powered tanker.

Initial tests soon verified

that the idea was indeed a valid one, although those tests were in fact preceded by the first firm order for a derivative that possessed the ability to refuel other aircraft in flight. Having maintained a close watch on Boeing's progress with the 367-80, the USAF very quickly recognised that it could well be adapted into a new tanker that would be far more compatible with the warplanes that were then in service or on the brink of being introduced.

In the 1950s, of course, developments tended to make much faster headway than they do today, but even by the yardstick of the times, the Air Force moved with surprising speed, placing the first of several contracts with the

Seattle-based manufacturer on 5 October 1954. When compared with later orders, the initial batch was relatively modest and covered just 29 production aircraft, there being no prototype as such. However, the speed with which this contract was secured handsomely repaid Boeing's enterprise and also confirmed the wisdom of pressing on with what was clearly a bold venture.

The new tanker would be known as the KC-135A and work on production of this small batch was soon well in hand, with the first example emerging from the factory at Renton in July 1956. The ceremonies accompanying this event emphatically emphasised the changing of the guard, for, whether by coincidence or design, the new tanker made its debut on the very same day that the 811th and last KC-97 was rolled out. In recognition of its birthplace, the KC-135A (serial number 55-3118) was christened 'City of Renton' and the 367-80 prototype was accompanied by a B-52 in a fly-past over the throng that had assembled to witness the occasion.

Several weeks later, in the early afternoon of 31 August 1956, 'City of Renton' ventured skywards for the very first time, with the 79-minute sortie culminating in a landing

Right: Arkansas ANG's 154th AREFS received its first KC-135As in January 1976 and later replaced these with the improved KC-135E version in 1984. The squadron lost its tankers in October 1986 when the unit was reassigned to Military Airlift Command and issued with C-130Es. (Author)



at Boeing Field in Seattle. Less than a year after that, following a test programme that was carried through with extraordinary rapidity using some nine aircraft (55-3118 to 55-3126), deliveries to the customer got under way when the tenth KC-135A to emerge from the factory (55-3127) was ferried to Castle AFB in California, where it was immediately assigned to the 93rd Bomb Wing's 93rd Air Refueling Squadron (ARS).

At that time, there appeared to be every prospect that other major USAF echelons like Tactical Air Command (TAC) would also utilise at least some examples of the KC-135A. As it transpired, this was not to be the case and all 732 of the KC-135As that were built were initially assigned to SAC, which, in November 1961, was designated by USAF headquarters as the single manager of the tanker fleet.

Delivery of those tankers was actually accomplished over a period of some seven-



and-a-half years, eventually ending on 4 February 1965 when 63-8875 was formally accepted. While this may have been the last example of the KC-135A to be taken on SAC charge, it wasn't actually the

last to be built, for that distinction fell to 64-14840, which entered the inventory a few weeks earlier, on 12 January 1965. Irrespective of that, at peak strength in the mid-1960s, SAC's KC-135 fleet was distributed amongst no fewer than 44 squadrons.

Inevitably, the succeeding years brought evidence of a decline in the number of KC-135As on charge. Attrition was one reason for that – modifications for different roles another. Furthermore, it is also worth noting that some aircraft were adapted to support the SR-71A, which required

the services of a dedicated tanker force. In all, 56 Stratotankers were eventually modified for this mission, with these being drawn from FY58-60 production batches. Most were full conversions, but 15 of them are often described as 'partial' KC-135Qs, by virtue of the fact that they could also transfer standard JP4 fuel. Apart from the need to carry the SR-71's special JP7 fuel, the KC-135Q version also acquired extra communications equipment.

In later years, reductions in the size of the bomber force were matched by a declining



Top: 133 ARS New Hampshire ANG KC-135A 59-1509 refuels neighbouring New Jersey ANG F-106A 59-0007 during an exercise. The tankers arrived at Pease AFB in the summer of 1975, giving the unit a new role – it had previously flown the C-130A. (Author) Above: This line-up of KC-135s at International Air Tattoo includes aircraft from Strategic Air Command, the Air Force Reserve and Air National Guard all feature. (Author) Right: An anonymous KC-135A refuels three F-4Cs Phantoms from the 170th Fighter Squadron/183rd Fighter Group of the Illinois Air National Guard.(via Author)



Right: The New Jersey ANG's 108th Air Refueling Wing traded-in its F-4E Phantoms for the rather more staid KC-135E in late 1991 but has retained its colourful tiger stripe markings. A close-up view of the tail artwork is given on page 87. (Author)



need for tankers in the front-line inventory and a substantial number of surplus aircraft were passed on to second-line elements of the Air National Guard (ANG) and Air Force Reserve (AFRes). However, in the event of mobilisation such as that which occurred during the Gulf War of 1991, SAC was to be the designated 'gaining' command – with the result that routine training always reflected SAC operating practices and procedures. Furthermore, ANG and AFRes aircraft also stood regular alert duty in support of nuclear-armed bomber strike forces.

More recently still, major reorganisation of the USAF resulted in the demise of SAC and TAC (as well as Military Airlift Command) and the emergence of Air Mobility Command (AMC) and Air Combat Command (ACC). For a time, both of these agencies included KC-135s of varying sub-types in their assets, but further reshuffles have since occurred and today the principal operator of the KC-135 is AMC, which has been actively consolidating its resources at fewer bases.

Looking more closely at the distribution of the tanker fleet, in late 1993, AMC actually possessed just under 300 examples, while the remaining 260 or so airworthy examples on USAF charge at about the same time were shared in varying amounts between five other USAF elements. Three of those elements formed part of the first-line forces, specifically ACC (with six aircraft); Pacific Air Forces (with 16) and United States Air Forces

in Europe (with nine). Finally, the ANG had approximately 180, while AFRes possessed about 50.

Turning the clock back, to consider the production history in more detail, as far as the USAF is concerned, 736 aircraft have seen service as tankers, although only 732 were actually built with the air refuelling role specifically in mind. In general, despite recent modification programmes that have resulted in new engines being fitted across most of the fleet, the basic airframe differs little from variant to variant and when employed in the tanker role, the main cabin area is usually left empty. However, the presence of a large cargo

door on the port side of the forward fuselage does permit the carriage of fairly bulky items of cargo. Furthermore, all versions may be fitted with seats in the event of it being necessary to airlift troops and quite a few Stratotankers were called upon to fulfil exactly this function both before and after the Gulf War.

Since it was designed primarily for the aerial tanker role, it follows that a considerable amount of fuel can be carried and this is contained in tanks located beneath the cabin floor and in the wings. In fact, fuel uplift when fully laden is of the order of 31,200 US gallons, which may be used either by the tanker itself or given away to recipients.

There's no doubt that the original KC-135A most definitely revolutionised the business of transferring fuel in flight, but the post-production modernisation programmes that resulted in the advent of the turbofan-powered models bestowed even greater productivity, to the point where today's 'cleaner and greener' technologically-improved and ecologically-friendly KC-135R is far superior to its erstwhile predecessor.

Study of a few comparisons will perhaps best illustrate the extent of that superiority. Firstly, there is the matter of maximum unrefuelled range – with the KC-135A, this was of the order of 9,940 miles, but the KC-135R has significantly



Right: KC-135R 62-3515 of the 305th ARW based at Grissom AFB demonstrates the (relatively) environmentally-friendly benefits of its CFM56 engines for the benefit of an air show crowd. (S.J. Bushell)



Above: The prototype KC-135R 61-0923 made its first flight on 4 August 1982 and was used by the Air Force Flight Test Center for trials before being handed over to the 384th BW at McConnell AFB, Kansas. (MAP/G Cockle)

longer 'legs' and can cover an impressive 11,309 miles. If one then considers an identical fuel offload of 120,000lbs, the variation is equally marked, for the radius of the KC-135A was some 1,150 miles, while the comparable figure for the KC-135R is half as much again, at 1,724 miles. Gains were also made with the other re-engined derivative, which was known as the KC-135E. In truth, these were rather less spectacular than those achieved by the KC-135R, but they were still warmly welcomed by ANG and AFRes crews.

Harking back to the original configuration, all of the 732 examples that were built specifically for the tanker role started life as KC-135As, being powered by 'stovepipe' Pratt & Whitney J57 turbojet engines. This powerplant quite definitely displayed tendencies that would have had the 'green' lobby clenching their teeth and jumping up and down in fury, had such a lobby existed in the 1950s when the KC-135A made its debut. Apart from the ability to generate a noise that was close to the pain threshold

irrespective of whether one was inside or outside the aircraft, the J57 also pumped out an amazing amount of 'clag', as anyone who has ever witnessed a KC-135A undertaking a maximum weight departure on a hot day will surely confirm.

In extreme cases, the cloud of smoke emitted as the aircraft struggled to gain flying speed was virtually impenetrable and it can't have been pleasant to be piloting succeeding aircraft in a cell launch using minimum interval take-off procedures. On days when the air was still, the trails left by four J57s working at full bore with water injection often lingered for several minutes after the KC-135 responsible had disappeared from sight – and faded from earshot. But, despite the anti-social tendencies (or, perhaps, because of them), it was always a stirring spectacle, as well as one that has become increasingly less common following the major re-engining projects undertaken since the early 1980s.

The first such programme was directly targeted upon the aircraft in service with the

ANG and AFRes and entailed the replacement of J57 turbojets with TF33 turbofans removed from a large number of redundant commercial Boeing 707s. This project resulted in a change of designation to KC-135E and the first example to be subjected to modification was 59-1514 in January 1982. By the time that the last two aircraft (57-2602 and 62-3527) were completed in August 1991, no fewer than 161 Stratotankers had been modified in this fashion. To that figure must also be added the four KC-135As which also acquired TF33s in 1991, although these retained the KC-135D designation that had been allocated after they were fitted with boom equipment

and reassigned from photo-mapping duties to pure tanker missions.

Even as the KC-135E project was getting into its stride, a more ambitious re-engining programme was also in hand. This was first suggested in the latter half of the 1970s by Boeing, but the decision to proceed wasn't reached until 1980 and it was to take two more years to produce a prototype conversion. Initially known as the KC-135RE, the first aircraft to be adapted (61-0293) made its initial flight in modified form on 4 August 1982 – and flight testing very soon revealed major benefits from substitution of the CFM International F108 high bypass ratio turbofan. Other aspects

KC-135 STRATOTANKER PRODUCTION TABLE

Serial Number Batch	Version as built	Quantity
55-3118 to 55-3120	KC-135A-01-BN	3
55-3121 to 55-3126	KC-135A-02-BN	6
55-3127 to 55-3135	KC-135A-03-BN	9
55-3136 to 55-3146	KC-135A-04-BN	11
56-3591 to 56-3606	KC-135A-05-BN	16
56-3607 to 56-3631	KC-135A-06-BN	25
56-3632 to 56-3658	KC-135A-07-BN	27
57-1418 to 57-1459	KC-135A-08-BN	42
57-1460 to 57-1495	KC-135A-09-BN	36
57-1496 to 57-1514	KC-135A-10-BN	19
57-2589 to 57-2609	KC-135A-10-BN	21
58-0001 to 58-0034	KC-135A-11-BN	34
58-0035 to 58-0064	KC-135A-12-BN	30
58-0065 to 58-0094	KC-135A-13-BN	30
58-0095 to 58-0130	KC-135A-14-BN	36
59-1443 to 59-1472	KC-135A-15-BN	30
59-1473 to 59-1502	KC-135A-16-BN	30
59-1503 to 59-1523	KC-135A-17-BN	21
60-0313 to 60-0342	KC-135A-18-BN	30
60-0343 to 60-0368	KC-135A-19-BN	26
61-0261 to 61-0277	KC-135A-19-BN	17
61-0278 to 61-0302	KC-135A-20-BN	25
61-0303 to 61-0325	KC-135A-21-BN	23
62-3497 to 62-3519	KC-135A-22-BN	23
62-3520 to 62-3549	KC-135A-23-BN	30
62-3550 to 62-3580	KC-135A-24-BN	31
63-7976 to 63-7980	KC-135A-24-BN	5
63-7981 to 63-8015	KC-135A-25-BN	35
63-8016 to 63-8045	KC-135A-26-BN	30
63-8470 to 63-8475	C-135F-01-BN	6
63-8871 to 63-8888	KC-135A-26-BN	18
63-12735 to 63-12740	C-135F-02-BN	6
64-14828 to 64-14839	KC-135A-27-BN	12
Total built		744

Note: Four other aircraft (63-8058 to 63-8061) were built as the KC-135A-01-BN (Boeing Model 739) for photo-mapping tasks, but all four were later stripped of specialised equipment and reconfigured for the air refuelling role as KC-135Ds. The same designation was retained following re-engining with the TF33 in the summer of 1990.

Below: The KC-135 family have provided the basic airframes for a number of test-beds. 55-3134 was one of 11 NKC-135As in service – one of its taskings was with the US Navy. (MAP)



of the modification programme included fitment of dual auxiliary power units; a turbine engine monitoring system; anti-skid disc brakes; a flight control augmentation system and improved landing gear.

Once the test results became known, orders for production conversions with the designation KC-135R were not long in coming. Boeing's facility at Wichita, Kansas was chosen to be the modification centre and the first examples emerged from the factory with new engines in the closing few months of 1984. Initial deliveries were made to the 384th Air Refueling Wing, which was resident at McConnell AFB,

Kansas – just across the runway from the Boeing plant and conveniently handy to 'trouble-shoot' any teething problems that might arise.

By the end of 1984, five production conversions had been completed and just under 30 more examples followed during the course of 1985, allowing SAC to begin assigning this vastly improved Stratotanker version to the 28th Bomb Wing at Ellsworth AFB, North Dakota. Thereafter, a steady stream of KC-135As were ferried to Kansas for upgrading and in April 1990 the 200th KC-135R was delivered to the USAF, while France's 11 surviving C-135Fs were also modified in

similar fashion between August 1985 and April 1988, henceforth being known as C-135FRs.

Today, more than 10 years after it was launched, the re-engining programme is still going strong at Wichita, with at least 336 KC-135As having been transformed to KC-135Rs. As a result, the emphasis is now on adapting the KC-135Q into the basically similar KC-135T standard, which should result in most if not all of the surviving 50 or so 'Q-models being modified – and it is likely that some of the 60-odd KC-135As that are presently in storage at Davis-Monthan AFB, Arizona will be similarly adapted for transfer

to overseas air arms such as Turkey.

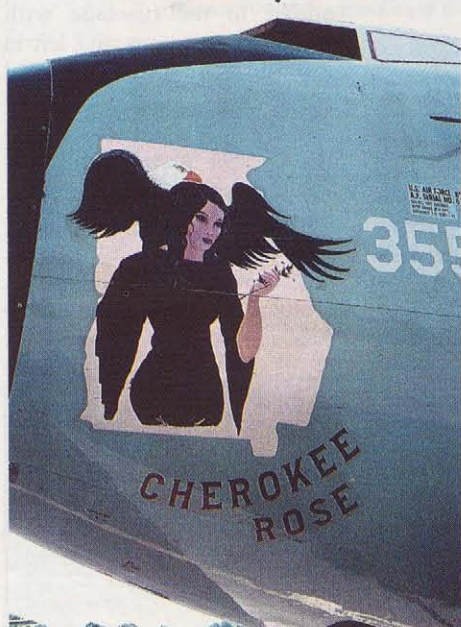
Initiatives such as these have succeeded in transforming the KC-135 – and have also ensured that it has a bright future, despite the fact that the basic design is now some 40 years old and that even the most youthful example was handed over to the USAF almost exactly 30 years ago. Well over 500 examples are still in service at the time of writing and with even the most pessimistic estimates of its future referring to it still being around until well into the next millennium, it's apparent that the Stratotanker is set to go on 'pumping gas' for many more years to come.



Close-up of the tail of New Jersey ANG KC-135E 59-1456 showing full-colour ANG badge, tail flash and tiger-striped refuelling boom. (Author)



KC-135E 58-0017 carries a fine selection of Desert Storm-inspired nose art, including its serial 'last four' in Arabic. (Author)



Cherokee Rose graces the nose of KC-135R 62-3554 of the 19th ARW. (S.J. Bushell)

KC-135 NOSE AND TAIL ART



KC-135E 58-0085 of the 336th ARS, AFRes at Boscombe Down in 1992. (S.J. Bushell)



319th BW's KC-135R 63-8006 displays Warlock Warrior. (S.J. Bushell)



*To round off our KC-135 coverage, Gary Madgwick reviews
Ertl's 1:72nd KC-135A*

This kit comes in a large box which befits its size as the finished 1:72nd scale model is very large. I looked forward to seeing this kit when it was announced at the Toy Fair a couple of years ago and when it finally arrived courtesy of Ertl I could not stop myself from starting it almost immediately.

The first thing to strike me was the very nice artwork on the box lid and then I opened the box to find it filled with light grey plastic, loads of instructions and a large decal sheet.

The instructions come as a two-part fold-out sheet and

include the aircraft history, building tips (great for the younger or less experienced modeller), full construction details and one of the best sheets I have ever seen on colour notes: from the cockpit interior, wheel wells and engines to the two colour schemes as depicted on the decal sheet.

There are around 125 parts including the clear transparencies and all parts are very well moulded with excellent surface detail.

Construction

The first stage is the cockpit

and interior. This is extremely well detailed with internal bulkheads and partitions, the crew lavatory, navigator's and flight engineer's positions together with the pilot's positions and this area also includes all details together with optional decals or painted instrument and console panels.

All colour details are given for each part of the cockpit and this area is well worth taking time over as it can be seen through the cockpit glazing.

The refueller's boom position in the lower rear fuselage is also fully detailed.

The wings were constructed next and this was where I came across my first problem. The wings are made in five parts which includes upper and lower wings for both sides plus a fuselage-to-wing jointing piece. The wing joint between the wing and fuselage/wing joint does not locate into anything and the joint would not

seal without recracking. I overcame this by packing under the joint with plastic card and leaving it to dry for 24 hours. The joint could then be filled and sanded but care must be taken as the engine pylon locating holes are along this joint and will need to be drilled out again.

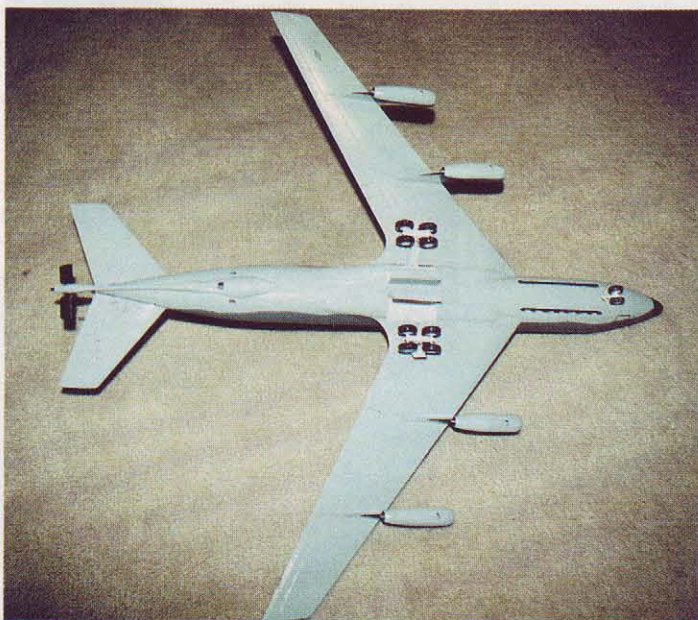
The engines were then made with all the fan details pre-painted and detailed. Again, these were cleaned up and any filler needed was applied and sanded before the units were added to the wings.

The undercarriage bays were assembled and internal painting carried out in preparation for insertion into the fuselage. All the sub-assembled parts were now complete together with the two internally-painted fuselage halves and I was ready to add all the sub-sections to the fuselage.

Here I met a major problem as there are no locating plugs to line up the fuselage halves. Again plastic sheet was used, glued along the halves and overlapping both sides. All in all, this was quite a tricky job to complete all round the fuselage yet leaving clearance for the internal details so that the halves mated together.

Once I was satisfied with the alignment super glue was used around the fuselage and left to dry. After about three hours I then ran liquid poly glue to the remaining areas and again this was left to dry overnight. The completed wing assembly was added to the fuselage with three-minute epoxy and left to dry. The engines were not fitted at this stage.

At this stage I also added the cockpit glazing, masking out the windows to prevent damage during the later construction stages. Squadron/Signal white filler was used around the joint lines to the fuselage and when dry was



A selection of KC-135 references

Air Forces Monthly – *Desert Storm Special*
Airlife – *Inside the USAF, the USAF in the 1990s*
Concord Colour Series – *Supershow IAT & Tiger Meet 91*.
Detail & Scale No 44 – *KC-135 Stratotanker*
Osprey Superbase No 5 – *Mildenhall*
Scale Models – *December 1987; May 1993*
Squadron/Signal No.118 – *KC-135*
World Air Power – *US Air Force Directory*
World Air Power – *US Air National Guard*

sanded down. It was at this stage that two more problems occurred.

The first problem was that the cockpit glazing left a ridge of about 1mm where it joined the fuselage top and this needed quite a bit of filler to blend it in. Secondly, when sanding the fuselage on the top rear section the moulded bands around the fuselage were almost sanded off and great care must be taken in this area. On my next KC-135 kit I may sand off all the bands and reglue new strips of plastic to the correct size over the finished model.

The last major assembly task was adding the engines and tailplanes together with undercarriage legs and boom. The complete model was then cleaned up and ready for fine detailing to your choice.

The Airwave detail set can be used for some of the fine points and DB do various detail and conversion sets together with True Detail, which also does an internal detail galley set and a very nice wheel set with bulged tyres to represent the aircraft at rest.

The wheel set is excellent and I will be using it on my next KC-135 as I had already heat bulged the kit wheels when the wheel set arrived from Pocket Book Models, importers for the True Detail range.

I also cut out the navigation lights ready for replacement with either Premier Plus or Blue Bird Models navigation lights as required – these were added after painting had been completed.

Painting

After a coat of acrylic grey primer and final filling and sanding to areas requiring further attention, the model was ready for painting. First, the cockpit glazing was masked, together with any other areas not to be painted or that had already been painted during assembly.

The kit comes with two choices of decal produced by Scalemaster. The first colour scheme is for the 92nd Bomb Wing based at Fairchild AFB, Washington and comes in the early scheme of Light Grey FS 16473 overall. The aircraft is



serialled 57-1423. The second scheme is for 56-3653 from the 93rd Bomb Wing at Castle AFB, California and is the current low visibility colour scheme of FS 36473 Light Gray underside and FS 36118 Gunship Gray on the top surfaces. As with all Scalemaster decals these go on very well with no out-of-register markings.

The finished kit looks superb and is over 22 inches long. It also features optional parts of the hose and drogue refuelling adaptor. Ertl have announced plans to produce other versions of the KC-135

and, together with the DB conversions and cross kitting with the AWACS family, nearly all the versions can be made. As well as all the accessories mentioned above, Superscale produces a sheet covering the KC-135.

I have now decided that my next model will be the French Air Force C-135FR in special markings which should look stunning. In the meantime an article is in preparation using the conversion parts from Leading Edge of Canada to build a Royal Australian Air Force 707 refueller. More later ...

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In my drawings of the Harrier (*Scale Aviation Modeller* Volume 1 Issue 1), I stated that the Pegasus II-61 trials Harrier was overall black with white trim. It has been pointed out to me that this is incorrect. The scheme should be as follows: Overall Dark Blue, which is a

mix of 25% Black and 75% Roundel Blue, mixed at Dunsfold. All other markings are as stated, with the addition that the wing tips and tailplane tips are also white. The national markings are toned down. Sorry for any problems this may have caused.

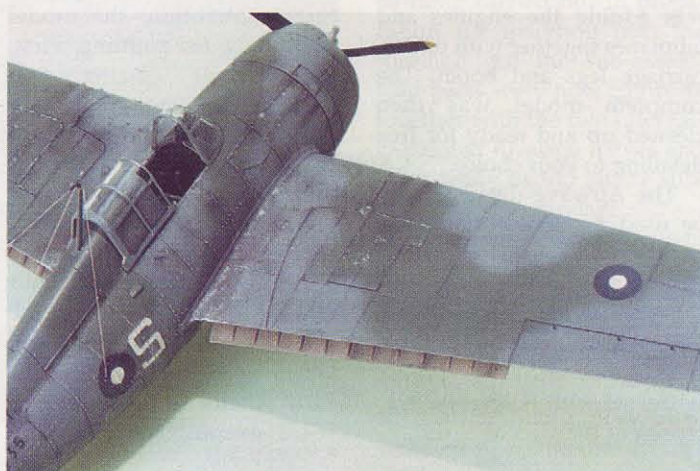
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Due to an oversight, we neglected to show a photograph of Jonathan Mock's completed Martlet. We are also taking this opportunity to show a close-up of the aircraft displaying the weathering detail and lowered flaps.



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New markings on the Chinook fleet

The upgrading of the RAF Chinook force to HC.2 standard is now well advanced. Until August of last year – by which time the last HC.1Bs had departed Odiham for conversion – the returning updated machines were pooled by No.7 Squadron and No.27 (R) Squadron (alias 240 OCU).

No unit markings were applied and single white code letters were worn on the rear rotor pylons (as on ZA681/S). In September, with enough HC.2s available to allow the two units to have their own aircraft, squadron markings and unit codes started appearing in the same locations as on the HC.1s, although the code letters on the front rotor pylons were still absent on some machines during December: examples present at Odiham at this time included ZA682/EN of No.7 Squadron and ZA673/FF of No.27 (R) Squadron.

In keeping with the toned-down single colour camouflage of the HC.2s, this being matt Dark Green BS381C:241, the squadron emblems are of a reduced size. However, unlike the code letters, which are in matt black, these unit emblems are in gloss black – probably to make them more conspicuous: if the sun

catches them at certain angles, they stand out like shining silver lights! Gloss paints also wear better, as the paint shop (or rather paint removing shop) at Odiham found out in 1991 when they had the onerous task of trying to remove the black daubings all over certain Desert Pink HC.1s following the Gulf War.

With the exception of the first two Chinook HC.2s, which retained the large size roundels, fin flashes, serials and 'ROYAL AIR FORCE' titling carried by the HC.1s – ZA681/S is one of these – all others have these markings in much reduced size.

It is also worth mentioning that most Pumas of that other famous Odiham unit, No.33 Squadron, also carry their hart's head emblems in gloss black.

R L Ward

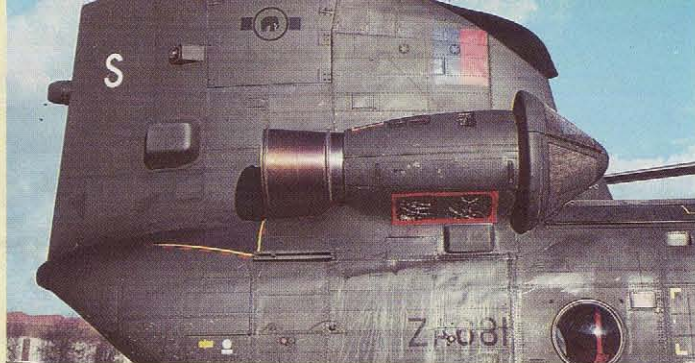
Right: Chinook HC.2 ZA682/EN of No.7 Squadron receives attention at Odiham in December. Note the small unit badge on the rear pylon and the absence of code letters from the front pylon.



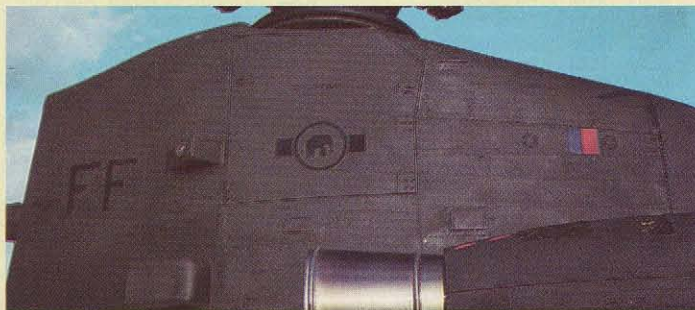
Visiting Odiham in December was a Harrier GR.7, ZG501/E, from Boscombe Down, wearing its new Air Warfare Centre nose and fin markings. The AWC was previously known as the Strike/Attack Operational Evaluation Unit (SAOEU). On the port nose appeared the pilot's and ground crew names, and a Wing Commander's

pennant in what seems to be an increasingly common presentation on modern RAF aircraft, with the point of the triangle to the left. Perhaps someone who knows about these matters from an official viewpoint can confirm the correctness of this, for this writer has always understood that tradition dictated that the 'blunt end' is to the left and the 'pointy end' is to the right ... but then, we do live in a changing world.

Many thanks to the CRO at RAF Odiham, Sergeants Bob Funnell and Rod Ulrich, and the Public Relations Staff at RAF Strike Command HQ for their generous assistance.



Chinook HC.2 ZA681/S of No.27 (R) Sqn (above) retains the old style of single white code letter while the same unit's ZA673/FF (below) carries black two-letter codes. (All photographs by R L Ward)



Left: The tail unit of Harrier GR.7 ZG501/E displays the Air Warfare Centre's circular emblem while the stylised Harrier and Tornado marking (below) appears under the cockpit.



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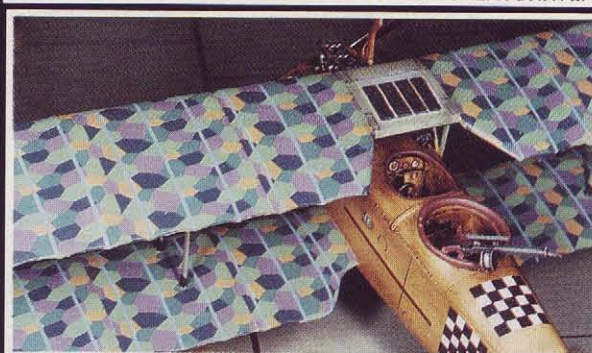
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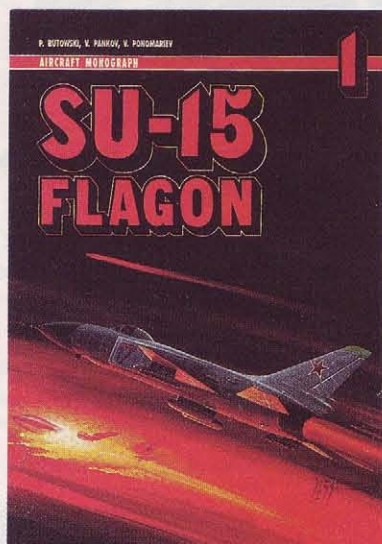
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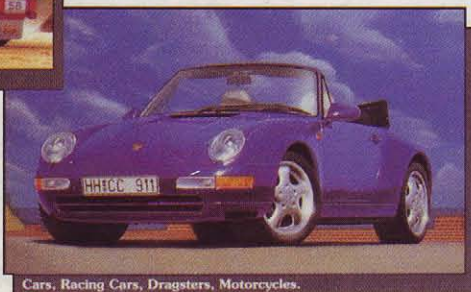
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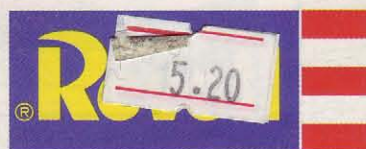
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